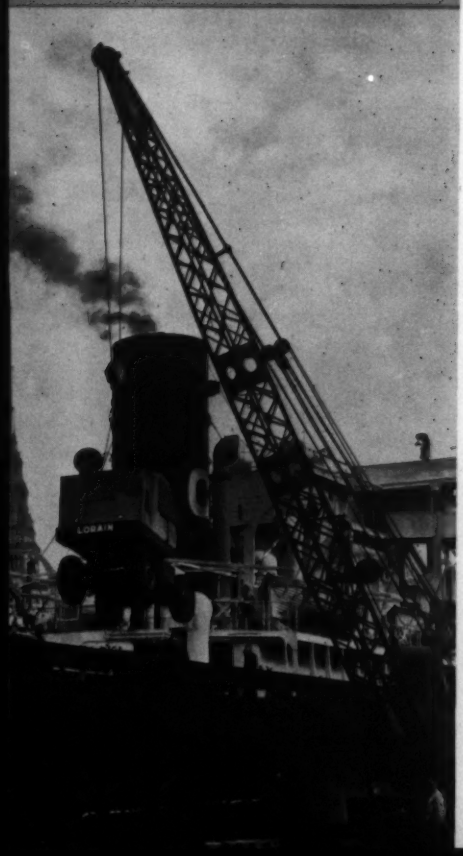
How Seaway Can Benefit You . . . Page 52



MARCH 7, 1960

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

No. 5 in STEEL's Program for Management

Production Efficiency—How You Can Sell It to the Boss

What the Scrap Price Decline Means

Pressure for LIFO Relief Mounts

U. S. Must Depend upon Foreign Sources for a Third of Its Iron Ore

Fluidized Plastic Powders Coat Steel

Pressure Pouring Offers Potential Shortcut to Casting Steel Billets

COMPLETE CONTENTS
TURN PAGE

METALWORKING WEEK
PAGE 37

automation-

where so much depends on so little

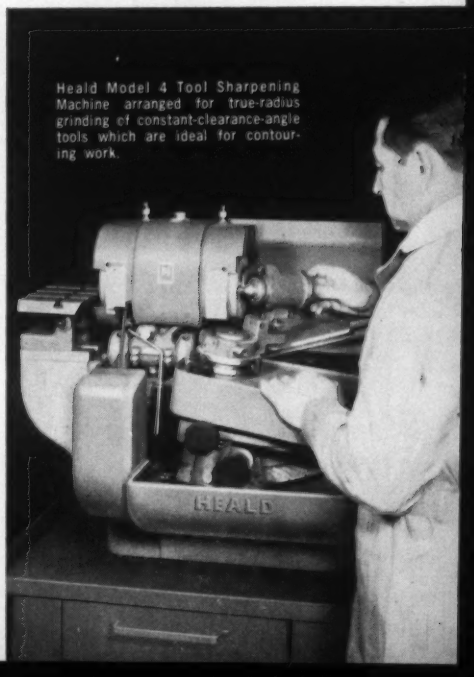
when the tool tip contacts the work

The modern automated production line is a miracle of cost-saving efficiency. But all its ingenious complexity has but one purpose—to bring work and tooling together. *That's* the point where it either pays off or it doesn't.

To assure maximum productivity—hence maximum return on the investment—cutting tools must be sharpened with machine precision. When they are ground on a Heald Model 4 Tool Sharpening Machine, *exact tool geometry* is obtained every time—and cutting edges *last longer*, saving down-time for tool replacement.

This advanced design machine is available for both true-radius and conventional elliptical-point tool grinding. Its fully automatic tool reciprocation assures uniform and repetitive tool tip accuracy and permits one operator to tend several machines at the same time.

Ask your Heald engineer for complete information on the Model 4 Tool Sharpening Machine, or send for Bulletin 2-4-3, Issue 1.



Heald Model 4 Tool Sharpening Machine arranged for true-radius grinding of constant-clearance-angle tools which are ideal for contouring work.

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Subsidiary of The Cincinnati Milling Machine Co.

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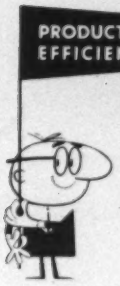
This Week in STEEL

The Metalworking Weekly

March 7, 1960 Vol. 146 No. 10



How to Sell It to the Boss

Many a good idea for an equipment purchase has died when the manager couldn't sell it to top management. Your idea may stand a better chance after you study these selling tips:

1. Know the facts.
2. Ask for help from associates.
3. Make the pitch.
4. Reassure the boss.
5. Keep him sold.

PAGE 57

What the Scrap Price Decline Means

The sharp drop in scrap prices reflects: 1. Record high inventories. 2. The outlook for lower steel operations in the second and third quarters of 1960. Long term significance: The shortage of pig iron capacity in the immediate postwar period drove scrap prices abnormally high. With pig iron in good supply, scrap is now seeking a more normal price level. PAGE 47

Pressure for LIFO Relief Mounts

Ten Illinois manufacturers using LIFO incurred $1.25 million additional tax liabilities because the steel strike forced involuntary inventory liquidation. The Treasury Department is reviewing their experiences before making recommendations on a proposed bill to give LIFO users tax relief. PAGE 49

Imported Iron Ore Supplies 1/3 U. S. Needs

Record tonnages of foreign iron ore will pour into U. S. blast furnaces this year. In 1959, 36.5 million tons were imported and accounted for 38 per cent of strike-depressed U. S. consumption. Our total needs this year are expected to reach a record 135 million gross tons; imports of 44 million to 47 million tons will account for 33 to 35 per cent of the total. PAGE 50

Fluidized Plastic Powders Coat Metals

A fluidized bed process for coating metals with plastics shows commercial promise. A gas stream forced through finely powdered resin makes it act like a fluid. Parts are preheated and dipped into the powder. PAGE 82

Pressure Pouring May Cut Steel Costs

Watch for lower cost production of some cast, semifinished steel shapes as steelmakers experiment with controlled pressure pouring of billets. The foundry technique, in which air pressure forces liquid metal up through a refractory tube into a mold, may eliminate costly mill equipment like soaking pits and blooming mills. It will be tried on a pilot scale at a U. S. Steel Corp. plant. PAGE 90

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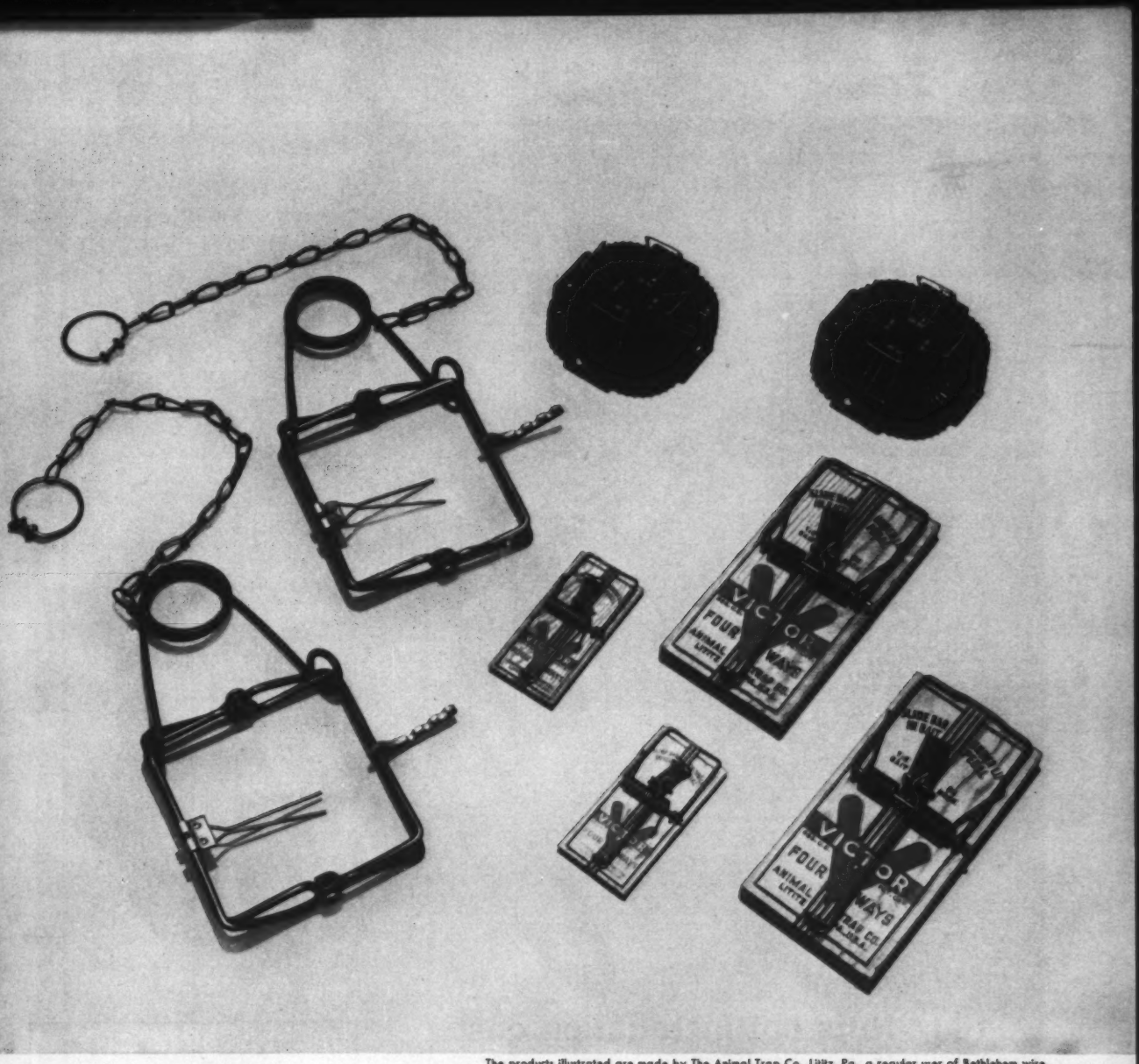
Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $30 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.



The products illustrated are made by The Animal Trap Co., Lititz, Pa., a regular user of Bethlehem wire.

Steel wire builds that better trap

Whether you want to trap animals or catch customers, you can count on Bethlehem for top-quality specialty steel wire. Wire for animal traps, flexible shafts, rotisserie spits, welding, screw drivers, or hose-reinforcement . . . these are just a few of hundreds of uses for Bethlehem specialty wire.

Bethlehem Steel can turn out the exact wire for your requirements. All our metallurgists need to know is what you will do with it, and what conditions it must meet. We will select the right steel wire and give it the processing necessary to do the job.

Whether you need coppered wire, liquor-finished wire, fine wire, shaped wire, cold-heading wire . . . or industrial quality wire, we'll be glad to talk it over. Quite often we can help you turn a problem into a profit.

Just get in touch with the Bethlehem sales office nearest you. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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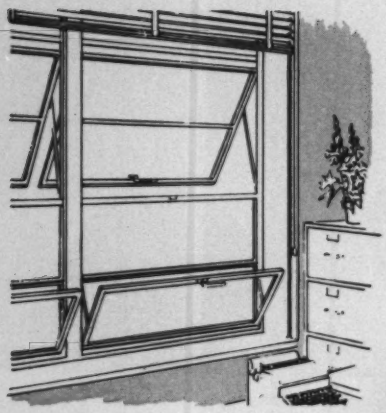
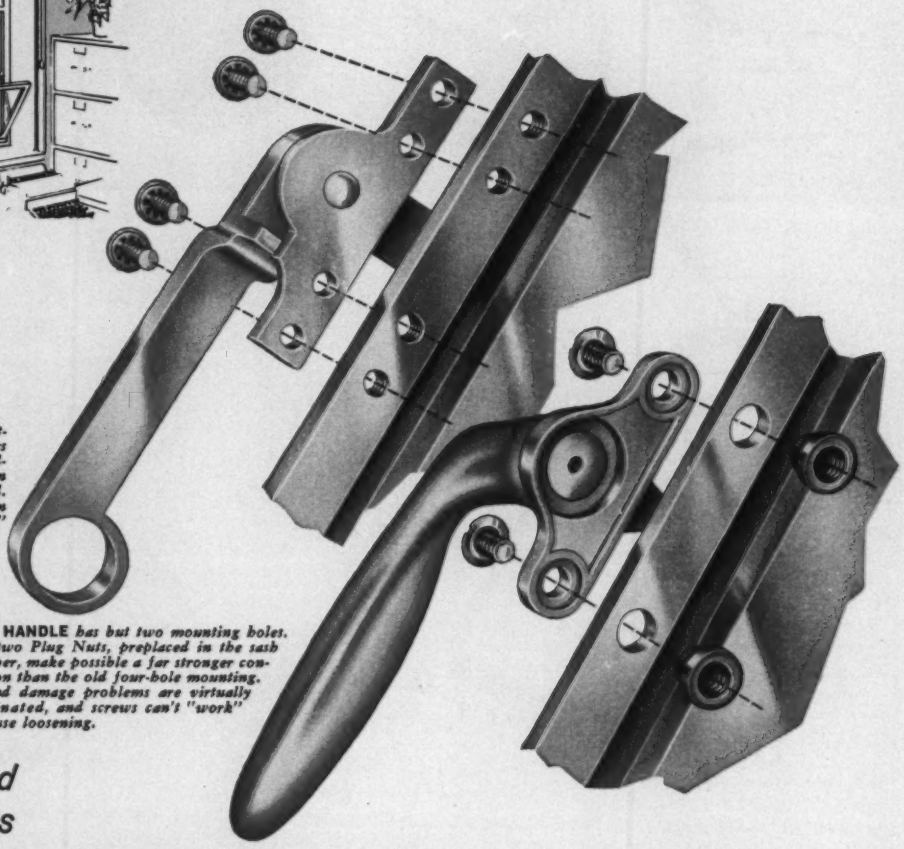
BETHLEHEM STEEL

BETHLEHEM STEEL





OLD HANDLE *required four mounting holes—and four tapped holes in the sash member. During installation, tapped holes were often damaged and had to be retapped. Handles frequently loosened in service because the screws "worked" in the holes.*

NEW HANDLE *has but two mounting holes. Just two Plug Nuts, preplaced in the sash member, make possible a far stronger connection than the old four-hole mounting. Thread damage problems are virtually eliminated, and screws can't "work" to cause loosening.*

On projected metal windows

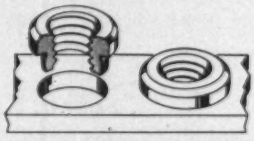
Plug Nuts cut installation costs... permit improved handle design

Using Plug Nuts to fasten window handles, a leading window manufacturer was able to: (1) improve handle design; (2) reduce installation cost; (3) eliminate handle loosening.

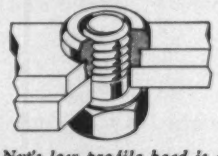
Plug Nuts are hardened, threaded inserts designed to be pressed into ductile material. Once inserted, the Plug Nut becomes a self-clinching, pre-placed nut—improving fastenability of thin or soft materials, such as steel, brass and aluminum. Plug Nuts are ideal for blind or hard-to-reach locations, and do not affect flatness of product material.

Plug Nuts are made for use in any thickness of material down to .030" and in any tap size from #4 to ¾". You can order Plug Nuts in case hardened steel, brass, various grades of stainless and aluminum in a full range of finishes. *Write for samples and complete application data.* Call your Lamson Distributor for immediate service on standard fasteners.

Distributors: Franchises for the sale of Plug Nuts are available in selected territories.



Plug Nut is easily inserted with hand punch or small press. Displaced hole material flows into knurls and annular groove, to clinch nut securely in place. Note that Plug Nut does not project through material.



Plug Nut's low profile head is a real advantage where clearance is tight.

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5000 TIEDEMAN ROAD • CLEVELAND 9, OHIO

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20 ft. Niles boring and turning mill recently installed at A. O. Smith Corp., Milwaukee, turning a large cylinder part.

The Octagon Boring Bar . . . The NILES Name

Niles machine tools have turned tons of chips over more than a half-century of production in most of America's largest metalworking plants.

Boring mills bearing the Niles name have another easily recognizable feature—the octagon-shaped boring bar.

Beneath (and behind) these external distinctions is *proved quality*, the *real* measure of profitable machine tools.

For boring and turning mills, 10 to 45 ft. table size, engine lathes from 50 in. swing and larger, and planer-type milling machines, check Niles first. They're built to do big jobs . . . big chip production . . . with modern electronic controls for high precision.

You don't baby a Niles—it's no baby

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HOW OLIN ALUMINUM HELPS YOU BREAK INTO NEW CASTING MARKETS

MORE EFFICIENT FORMS. Olin pig and ingot come in standard alloys, in 10, 25 and 50 lb. sizes. The 10 and 25 pounders feature smaller size to increase handling efficiency and speed melting, deep notches for easier breaking, 4-section design for faster crucible charging.

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PREDICTABLE MECHANICAL PROPERTIES. Batteries of testing devices like this tensile machine are used to check testing bars of Olin Aluminum for tensile, shear, compressive and twisting strength.

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Olin Aluminum can help you prove that point in the first place . . . and can help you keep your customer "sold" thereafter. That's because we provide you with:

- **Primary metal—made to the most critical "specs" for your most demanding jobs.**
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- **Ready access to Research and Development.**

Join those firms that are expanding their operations by finding new and better applications for aluminum castings. Make Olin Aluminum your source of superior casting alloys —*and* of metallurgical know-how.

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We Count 'em Too

In the world's largest market study, U. S. census takers will begin counting the nation's population Apr. 1. Since 1938, The Penton Publishing Co. has maintained a census of its own—it covers metalworking plants employing 20 or more. And that's no mean job, considering there are some 30,000 such plants and that our census folks have taken a recount every two years, with continuous updating in between.

The census idea has roots in the fine print at the bottom of our contents page: "STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more . . ."

Getting to Know You

That sentence reflects our controlled circulation policy (a story in itself). Through selective distribution of the magazine, we reach the people who are in positions where they can use the information on our pages. Which brings us back to the census, because that's how we find you. The census information defines our audience by company, location, number of employees, products, and operations. It helps our editors focus on a clear picture of the industry and oftentimes provides insights into industry trends.

We'll be telling you more about our continuing census in coming weeks. How data are gathered, verified, coded, and used will be among the topics. As they say in other media: "Please stand by."

The Bulge in the Mail Bag . . .

. . . was created this week by requests for reprints of the Feb. 15 article: "How to Get the Most Out of Your Scrap."

When asking for 300 copies, John McCoy, advertising manager, Dempster Bros. Inc., Knoxville, Tenn., said: "This is an excellent, informative article, typical of the editorial content of STEEL. We feel it will benefit our customers."

If that weren't enough to turn an editor's head, this one would do it. George Weiss, sales representative, Hill Acme Co., Cleveland, writes: "We want to insert reprints of the article in our correspondence to metalworking and scrap metal firms. We enthusiastically endorse the article and believe it should be circulated as widely as possible."

Diverting the Flow of Money

Coins and bills in circulation in the U. S. add up to $32.5 billion, say federal officials. If you would like to reduce that figure by $500 or $1000, have a go at our Usership Contest.

Here's How to Enter

Tell us, in 300 words or less, how you plan to USE an article or advertisement in this issue (or any other issue published this month—March, 1960) to help you accomplish an important personal or company objective. Be as specific as you can. If, in the opinion of the judges, yours is the best idea submitted—**you will win $500.**

There's more . . . you will win an additional $500 if you furnish written proof that you were successful in accomplishing your objective. Proof must be submitted within six months after you are declared winner of STEEL's Usership Idea of the Month Award.

Entries will be judged by a committee of STEEL editors. All letters become the property of STEEL Magazine.

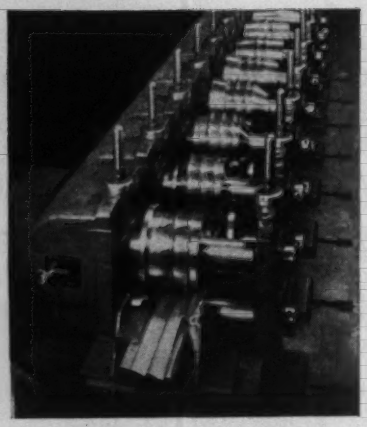
You can enter as many times as you wish, and there's plenty of time to think over your entries. **Deadline for the March contest is May 1, 1960.** Send your entries to me, Ed Service, Servicenter, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

P.S. You still have until Apr. 1, 1960 to send along your ideas for our February contest. Time's awastin'.

The Everlasting Editorial

Business publication editors are concerned more with the timeliness than timelessness of the words they write. Such factors as clarity, style, and sound thinking sometimes combine to place their words in the timeless category. Such is the case with "Parable of the Prices," written by STEEL's Editor, Walt Campbell, in July, 1957.

Once or twice each month since the initial clamor for reprints subsided, we have received requests for copies of that editorial. The latest:



Yoder Roll-Forming Equipment mass-produces shapes accurately, economically

Yoder Roll-Forming Equipment, even with part-time operation, can effect significant savings in many metal working applications and industries. Shapes, simple or complex, can be quickly and economically produced the Yoder way from a wide variety of flat-rolled coated or uncoated stock ... in thickness up to ¾ inch ... in speeds up to 50,000 feet per day.

Yoder engineers flexibility and precision into metal forming operations. For example: many basic shape modifications, such as coiling, welding, notching, ring-forming, perforating, and cutting to length can be simultaneously accomplished with little or no additional labor cost.

Yoder also makes a complete line of Rotary Slitters and Pipe and Tube Mills. Profit from Yoder's years of engineering and service experience, contact your local Yoder representative or send for the Yoder Roll-Forming Manual.

This fully-illustrated 88-page book clearly discusses every important aspect of Yoder Roll-Forming Equipment and methods ... it's yours for the asking!

THE YODER COMPANY
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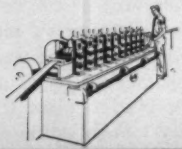


ENGINEERING YODER MANUFACTURING
COLD ROLL FORMING MACHINES

J. E. Isaacs, manager, industrial relations, Beech Aircraft Corp., Wichita, Kans., who saw it reproduced in another publication.

Says he: "It seems to us that the editorial is particularly pertinent at this time. We request permission to change the year 1957 to 1960 and to reprint the editorial for our top supervisory and management personnel."

For the Sorely Troubled

In part, here's what Walt had to say in 1957: ". . . Now I say unto you, first make thy costs competitive. Thy knowledge and thy skill, thy tools, and thine inventiveness, they will help you.

"And then I say unto you, when ye goeth into the market place, sell not first with price. Sell first with quality and service and engineering. Thy competitor, let him worry about prices. . . ."

For more on prices, here's an item from the Casket Hardware Manufacturers Association:

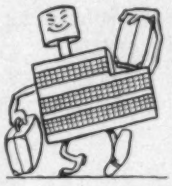
To Minimize Price Fighting

In a new program, members send quarterly profit and loss statements to CHMA which returns a consolidated report given in percentages. By comparing their data with the industry's, members can see which costs need adjusiment.

We quote CHMA: "Recognizing that lack of knowledge of costs is often an important factor in creating bad pricing practices within an industry, members have adopted the creed set forth in the article, 'The Case of the Vanishing Profits'" (STEEL, Sept. 28, 1959, pp. 82-84).

In the article, Acton Chance, the industrial detective, listed seven guiding principles that help minimize price fighting. Those points make up the association's new creed.

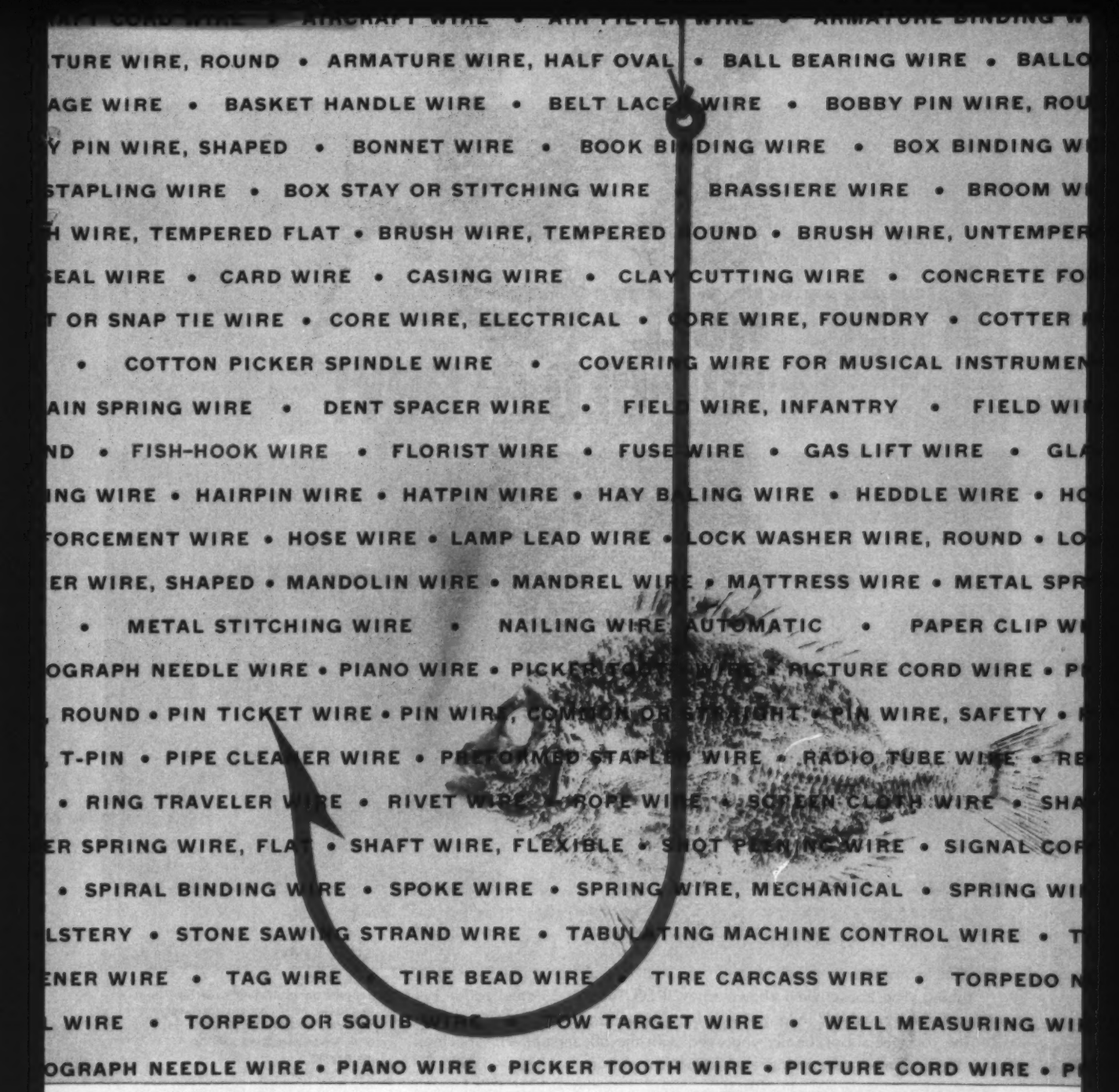
Read and Heed



Remember the tale of the city mouse and the country mouse? Each liked the other's habitat. So, following a quick taste of the "different" life, they swapped homes. After brief sojourns, the mice became disillusioned and scampered back to their original abodes.

Many metalworking companies contemplate moving from the city to the country and vice versa. But moving isn't as simple as packing a bag, picking up your plant, and hitting the road. (And there's no way to try temporary housekeeping, *a la* the mice.)

Next week, Chicago Resident Editor Austin Brant will discuss some factors which come into play when companies start searching for new plant sites. Whether you are a city mouse or a country mouse, check the article.


TURE WIRE, ROUND • ARMATURE WIRE, HALF OVAL • BALL BEARING WIRE • BALLO
AGE WIRE • BASKET HANDLE WIRE • BELT LACE WIRE • BOBBY PIN WIRE, ROU
Y PIN WIRE, SHAPED • BONNET WIRE • BOOK BINDING WIRE • BOX BINDING WI
STAPLING WIRE • BOX STAY OR STITCHING WIRE • BRASSIERE WIRE • BROOM WI
H WIRE, TEMPERED FLAT • BRUSH WIRE, TEMPERED ROUND • BRUSH WIRE, UNTEMPER
SEAL WIRE • CARD WIRE • CASING WIRE • CLAY CUTTING WIRE • CONCRETE FO
T OR SNAP TIE WIRE • CORE WIRE, ELECTRICAL • CORE WIRE, FOUNDRY • COTTER
• COTTON PICKER SPINDLE WIRE • COVERING WIRE FOR MUSICAL INSTRUMEN
AIN SPRING WIRE • DENT SPACER WIRE • FIELD WIRE, INFANTRY • FIELD WI
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FORCEMENT WIRE • HOSE WIRE • LAMP LEAD WIRE • LOCK WASHER WIRE, ROUND • LO
ER WIRE, SHAPED • MANDOLIN WIRE • MANDREL WIRE • MATTRESS WIRE • METAL SPR
• METAL STITCHING WIRE • NAILING WIRE, AUTOMATIC • PAPER CLIP WI
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• RING TRAVELER WIRE • RIVET
ROPE WIRE • SCREEN CLOTH WIRE • SHA
ER SPRING WIRE, FLAT • SHAFT WIRE, FLEXIBLE • SHOT PEEN WIRE • SIGNAL COR
• SPIRAL BINDING WIRE • SPOKE WIRE • SPRING WIRE, MECHANICAL • SPRING WI
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L WIRE • TORPEDO OR SQUIB WIRE • TOW TARGET WIRE • WELL MEASURING WI
OGRAPH NEEDLE WIRE • PIANO WIRE • PICKER TOOTH WIRE • PICTURE CORD WIRE • P

You can get fish-hook wire —or about as many other types of wire as there are fish in the sea, from American Steel & Wire. You can get quality steel wire in any size or quantity, produced to the most exacting specification. If you're not sure what you need, our sizeable staff of metallurgists is at your disposal. So are our facilities, the most modern in the world. Try us. You will be working with the WIREMAKER TO THE WORLD! American Steel & Wire, Dept. 0148, 614 Superior Ave., N. W., Cleveland 13, Ohio.

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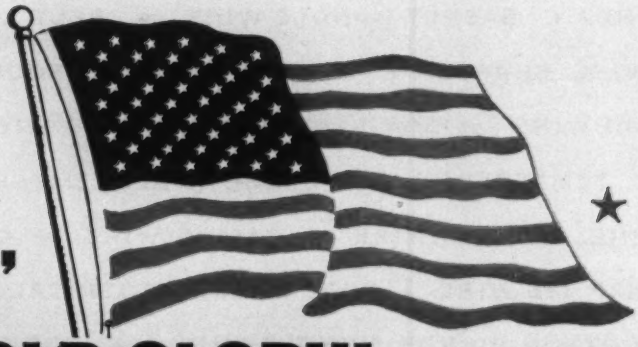
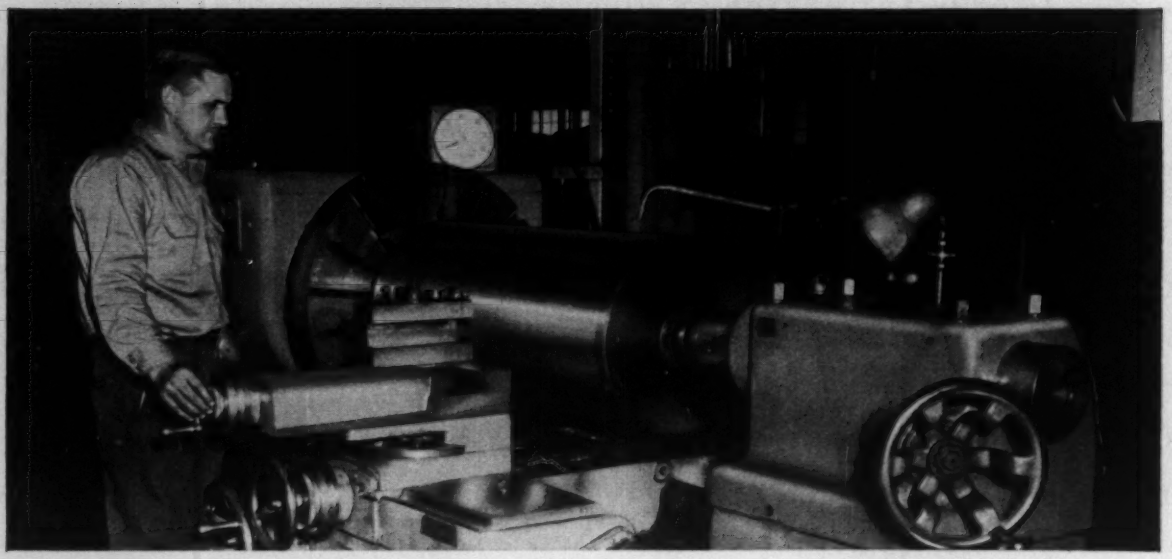


A NEW "ROLL" FOR OLD GLORY!



ACIPCO CENTRIFUGALLY SPUN ROLL USED IN PRINTING NEW 50-STAR FLAG

Here is an interesting application for ACIPCO centrifugally spun steel tubing. The above view shows an ACIPCO Type 1025 steel roll — 19" in diameter and 44" in length — being machined prior to copper plating. The roll was subsequently engraved with the 50-star pattern, and then utilized for printing multiple reproductions of our new flag on fabric.

Wherever tubular steel applications exist . . . ACIPCO spun steel tubes serve. Completely equipped to produce a wide variety of centrifugally spun and statically cast products, ACIPCO can serve your requirements more efficiently and economically because all its facilities are "under one roof."

For expert consultation on centrifugally spun tube applications in your field . . . call on ACIPCO.

VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES

SIZE RANGE
Lengths up to 40 feet have been produced to meet modern machinery requirements. O.D.'s from 2.25" to 50"; wall thicknesses from .25" to 4".

ANALYSES
All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel and special non-standard analyses.

FURNISHED
As cast, rough machined, or finish machined, including honing. Complete welding and machine shop facilities for fabrication.

Write for free illustrated catalog.

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SPECIAL PRODUCTS
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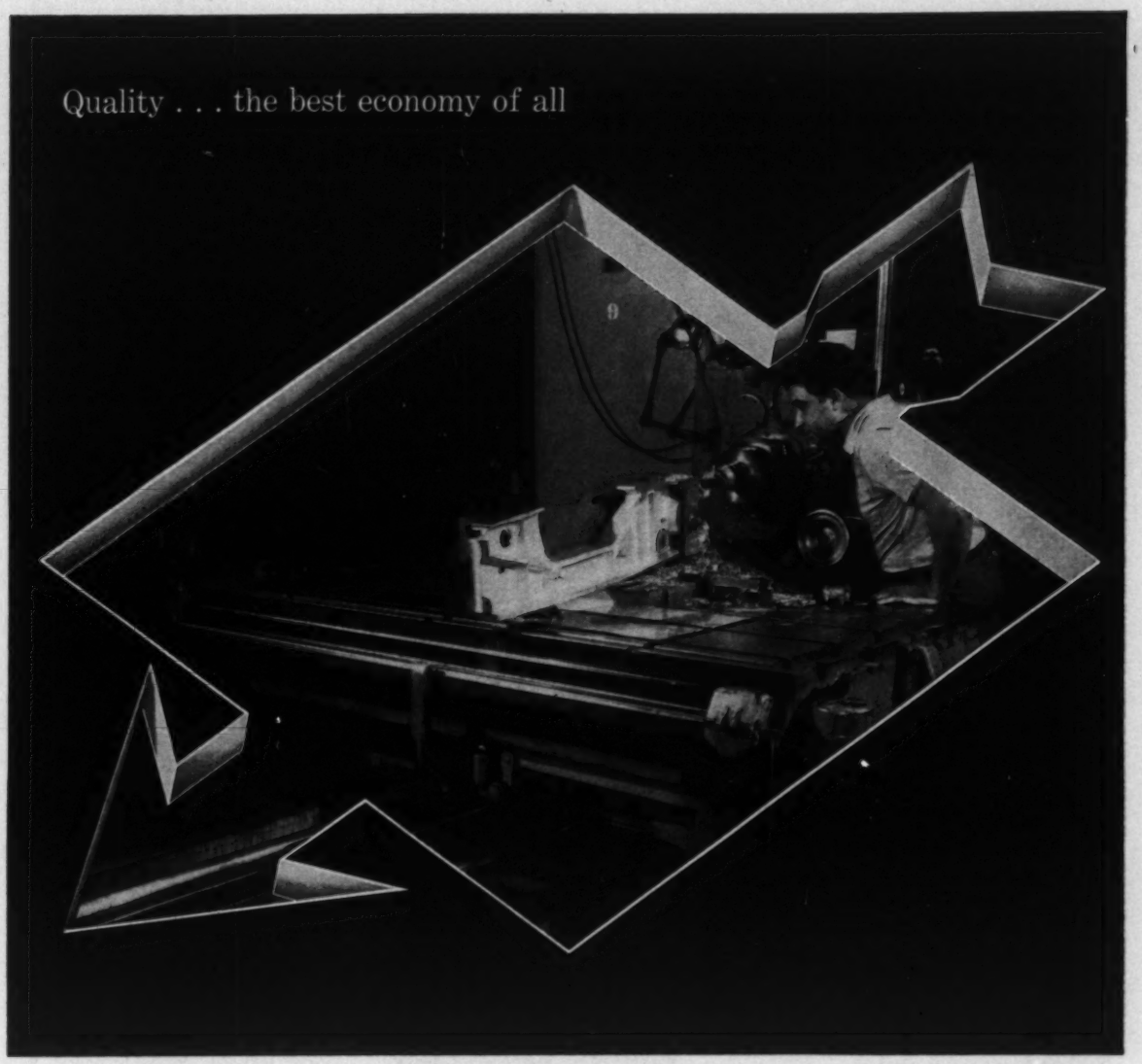

Fight the cost of "Stick-Slip" with Sunoco Way lubricant

"Stick-slip", the alternate grabbing and releasing of slow-moving carriages, can seriously score machine ways and ruin fine workpiece finishes.

Avoid this trouble and expense with Sunoco Way Lubricant, known throughout the world for its ability to cure "stick-slip". Special ingredients in Sunoco Way Lubricant form a durable, reinforced lubricating film along the mating surfaces. Result: There is no metal-to-metal contact even during week-end shutdowns; machines start easily; carriages move without intermittent grabbing. YOU GET FINER FINISHES, FEWER REJECTS.

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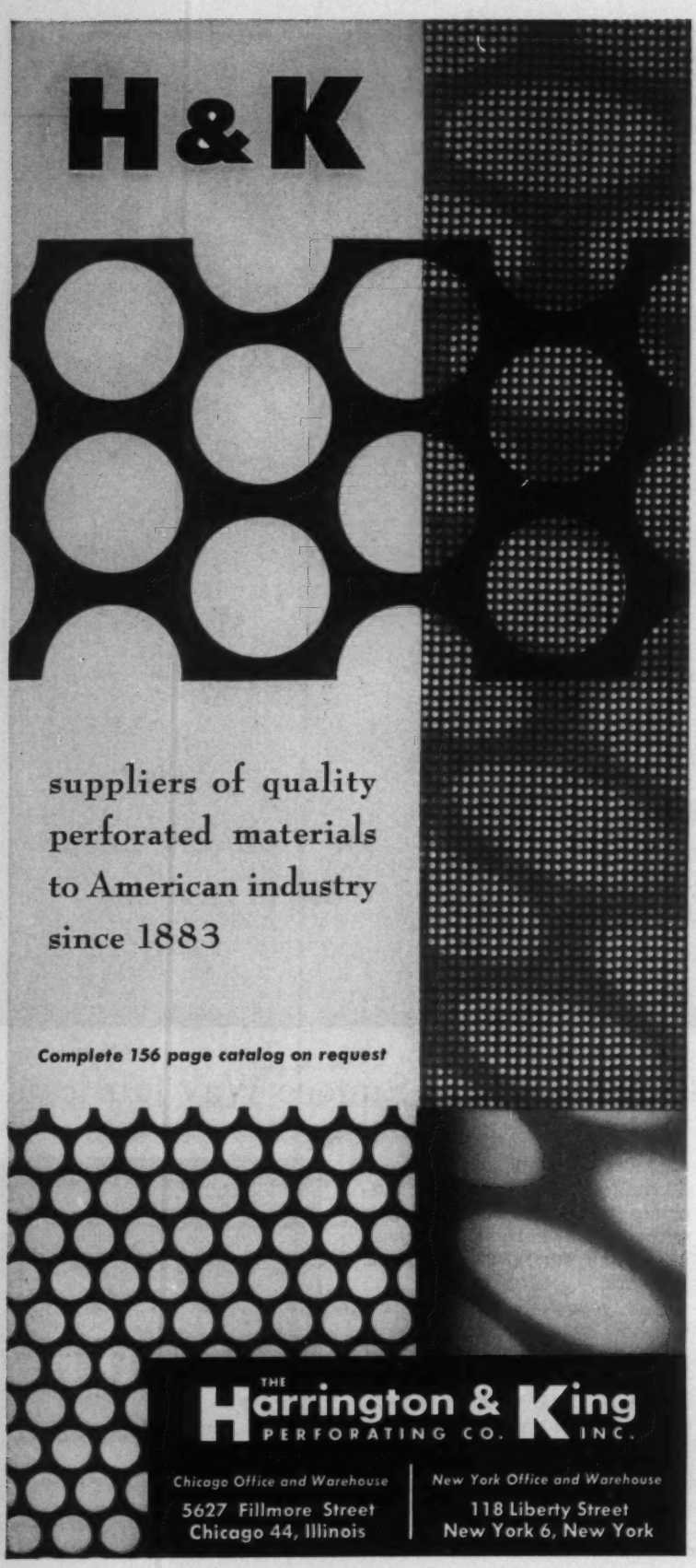
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CALENDAR
OF MEETINGS

Mar. 7-8, Steel Founders' Society of America: Annual meeting, Drake Hotel, Chicago. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Mar. 7-9, Association of Iron & Steel Engineers: Western meeting, St. Francis Hotel, San Francisco. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Mar. 10-11, Chamber of Commerce of the United States: National Construction Industry Conference, National Chamber Bldg., Washington. Chamber's address: National Chamber Bldg., Washington 6, D. C.

Mar. 13-15, National Association of Waste Material Dealers: Annual meeting, Waldorf-Astoria Hotel, New York. Association's address: 271 Madison Ave., New York 16, N. Y. Administrator: M. J. Mighdoll.

Mar. 14-18, National Association of Corrosion Engineers: National conference and corrosion show, Memorial Auditorium, Dallas. Association's address: 1061 M&M Bldg., Houston 2, Tex. Executive secretary: T. J. Hull.

Mar. 14-18, National Association of Manufacturers: Institute on Industrial Relations, Hollywood Beach Hotel, Hollywood, Fla. Association's address: 2 E. 48th St., New York 17, N. Y. Executive vice president: Charles R. Sligh Jr.

Mar. 15-17, Society of Automotive Engineers Inc.: National automobile meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Mar. 16-18, Electronic Industries Association: Spring meeting, Statler-Hilton Hotel, Washington. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Mar. 17, National Industrial Conference Board Inc.: General session for all associates, Somerset Hotel, Boston. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Mar. 21-23, American Management Association: Special manufacturing conference, LaSalle Hotel, Chicago. Association's address: 1515 Broadway, New York 36, N. Y.

Mar. 22-24, Society of Automotive Engineers Inc.: National production meeting, Statler-Hilton Hotel, Cleveland. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

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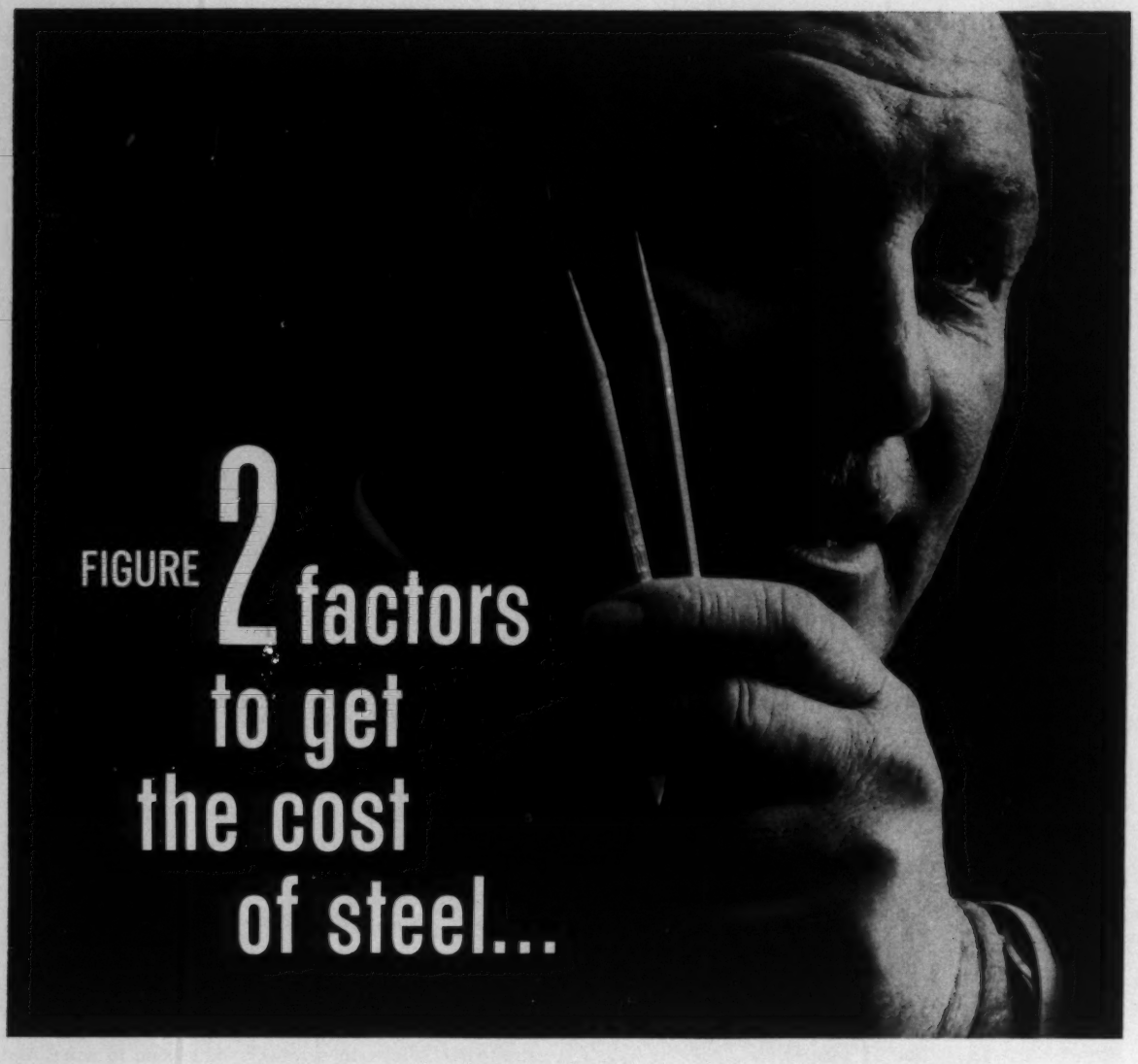

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Get the booklet, *What's Your Real Cost of Possession for Steel?* from your nearby Steel Service Center. Or write to Steel Service Center Institute, Inc., 540-G Terminal Tower, Cleveland 13, Ohio.

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Per ton delivered	_____
Cost of capital:	
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Other costs:	
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

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STEEL SERVICE CENTER INSTITUTE

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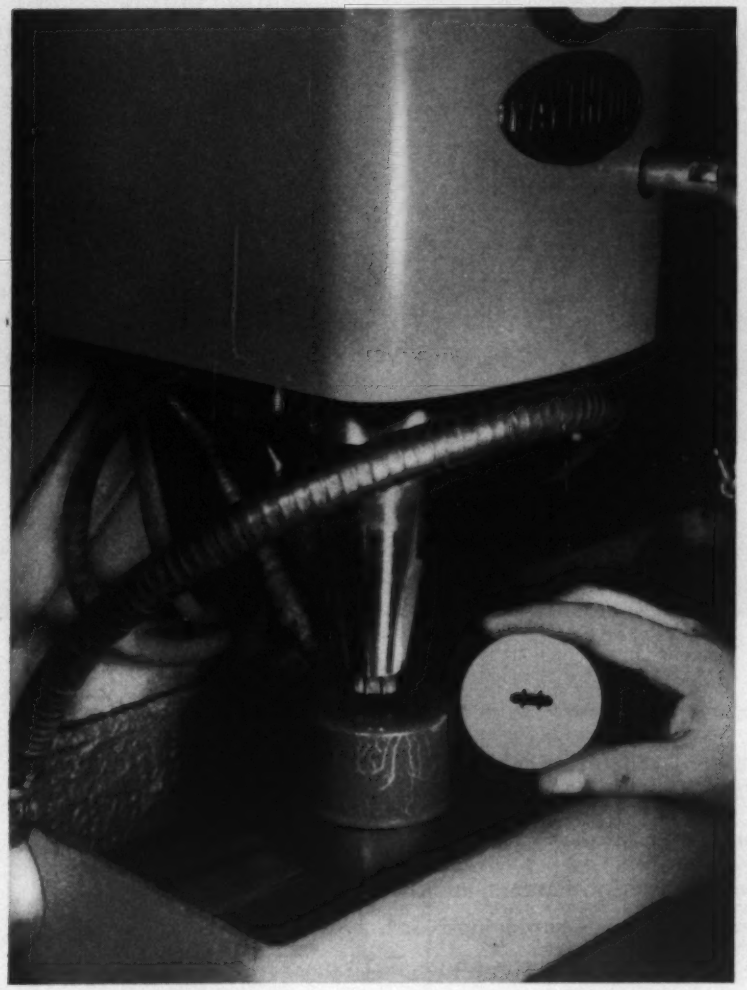
. . . NORBIDE boron carbide*



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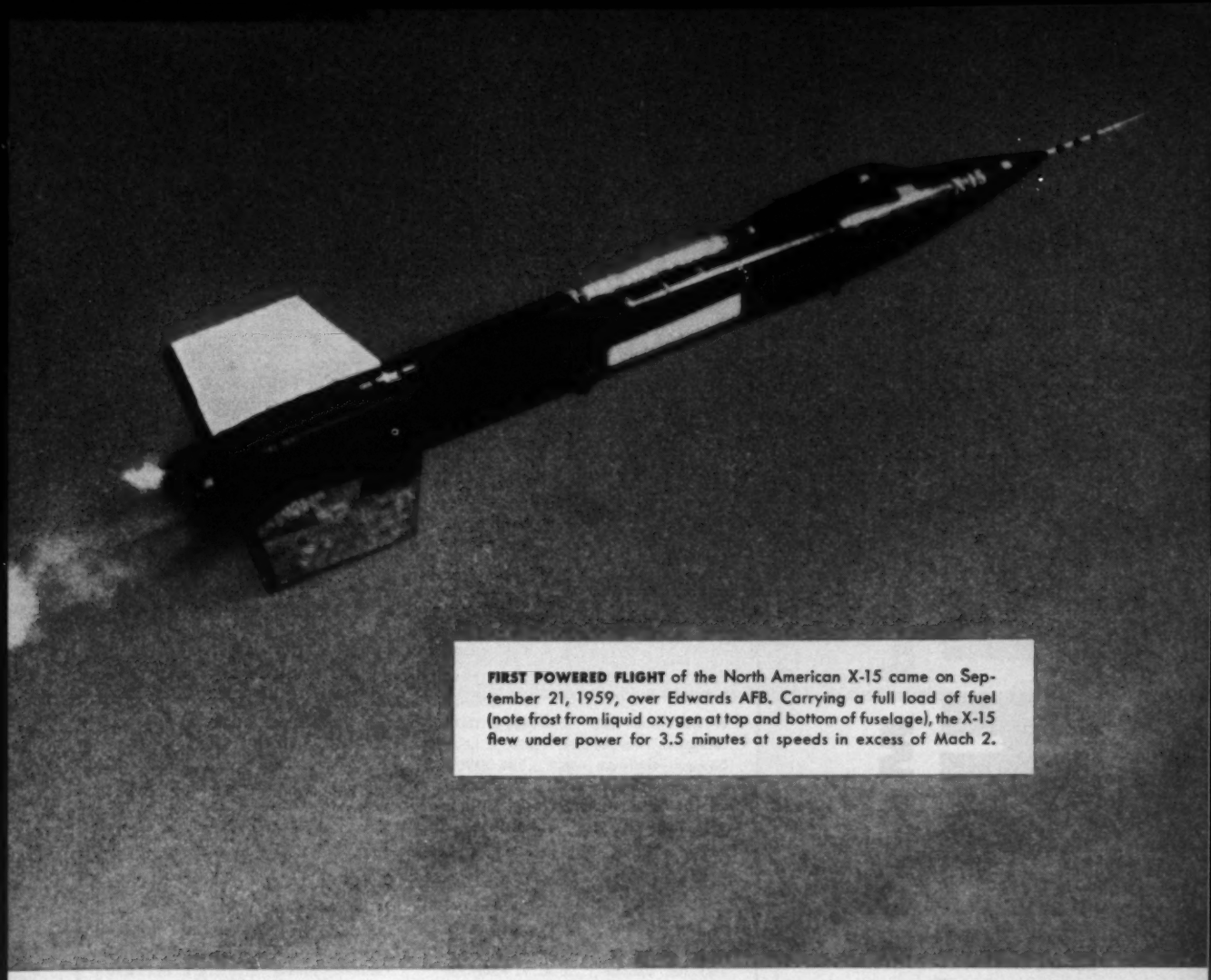

FIRST POWERED FLIGHT of the North American X-15 came on September 21, 1959, over Edwards AFB. Carrying a full load of fuel (note frost from liquid oxygen at top and bottom of fuselage), the X-15 flew under power for 3.5 minutes at speeds in excess of Mach 2.

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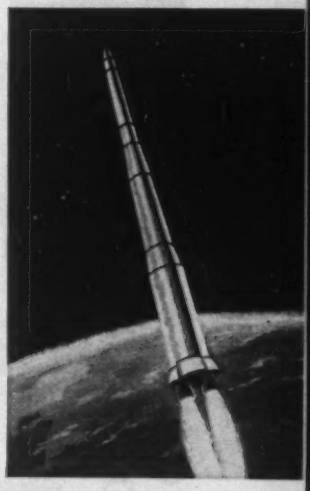

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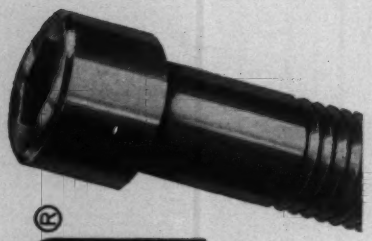

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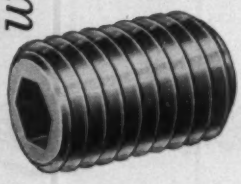

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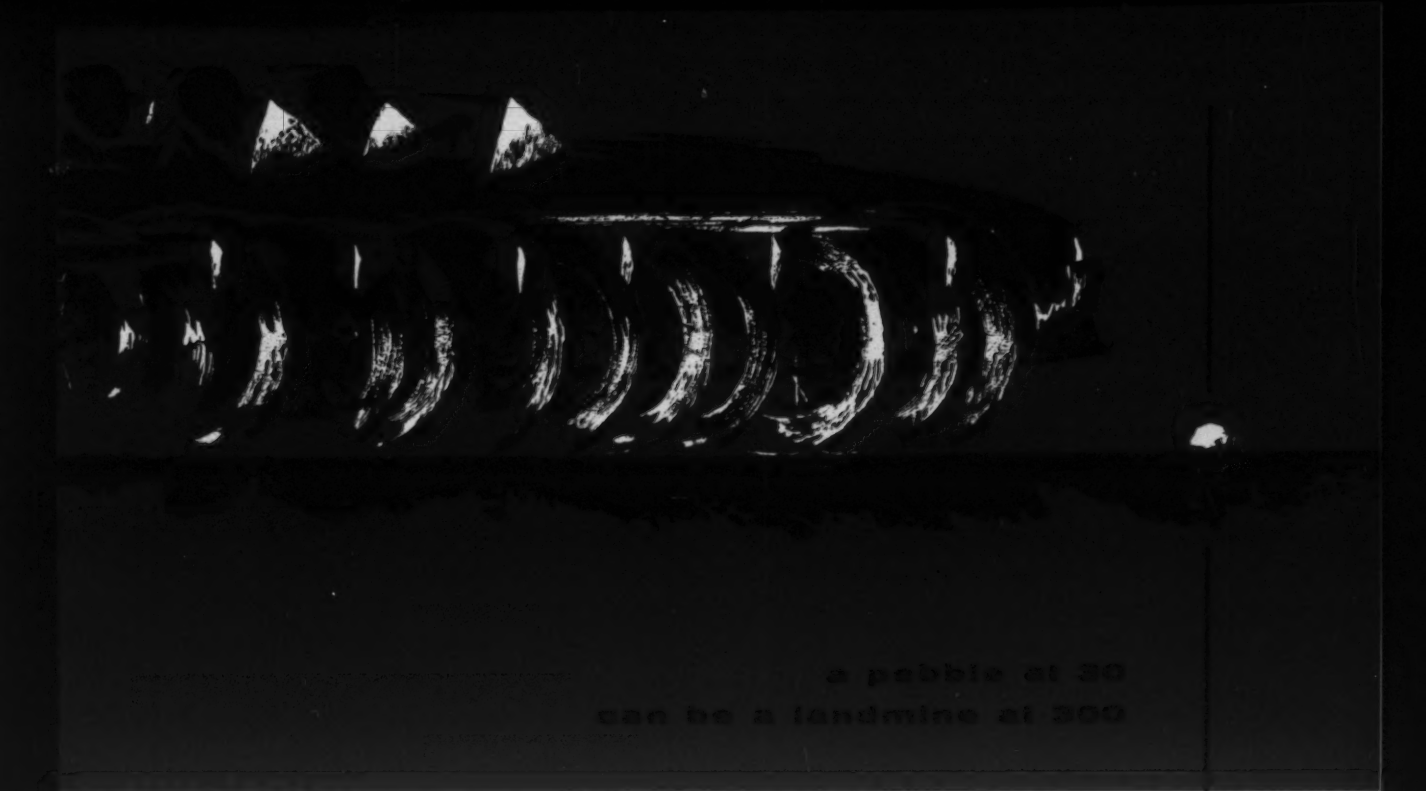

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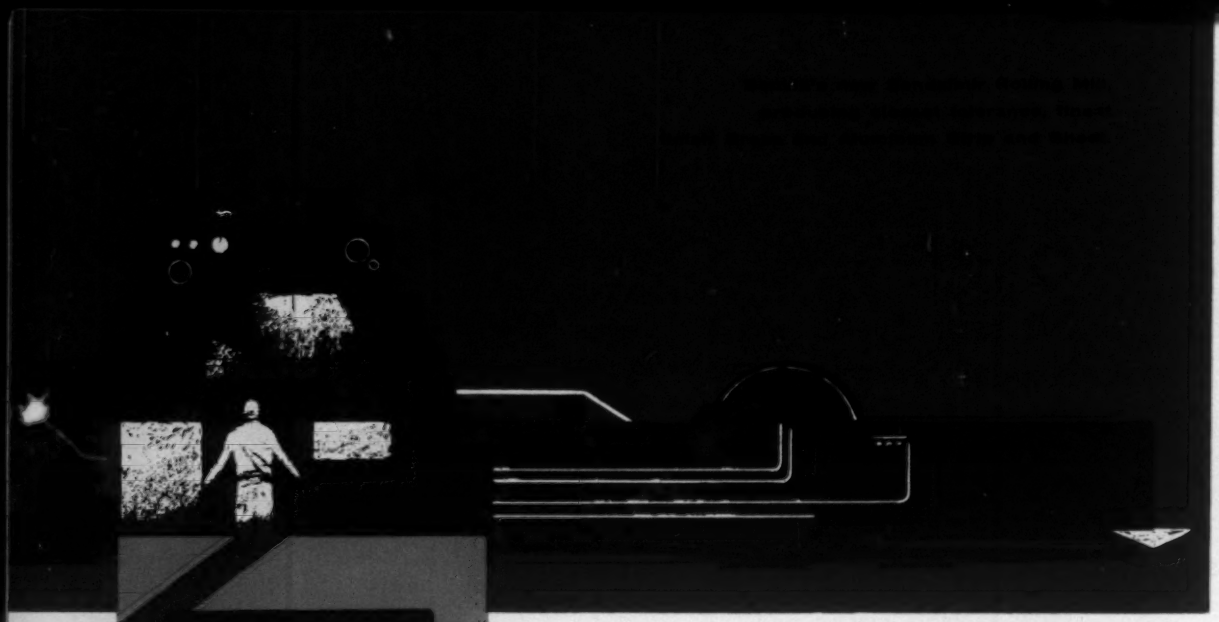

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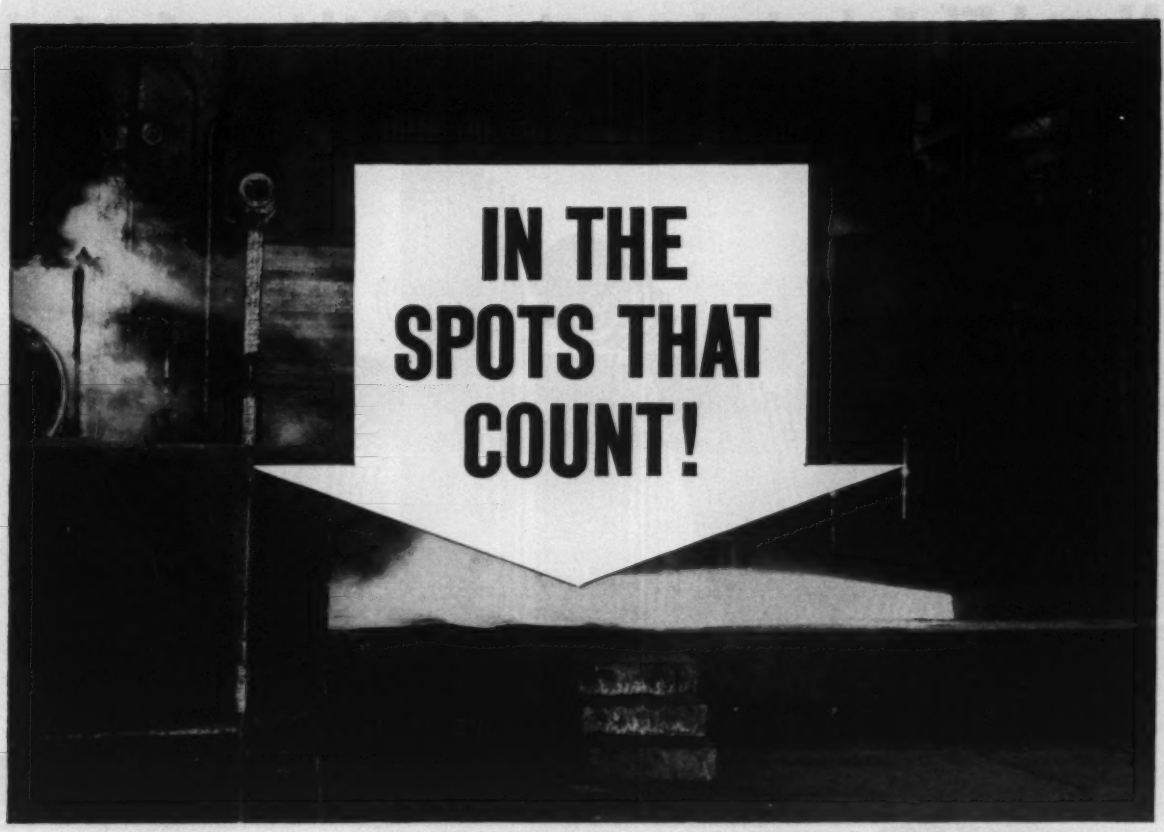

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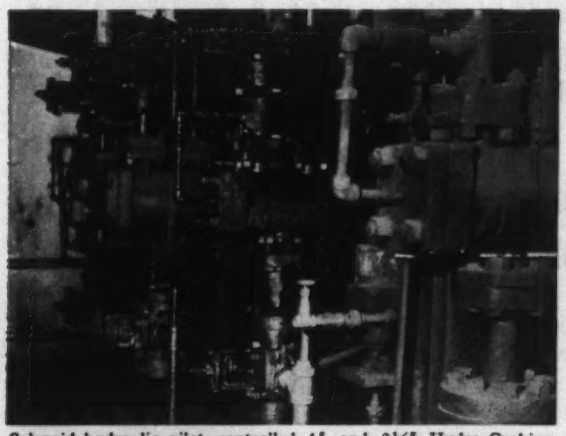

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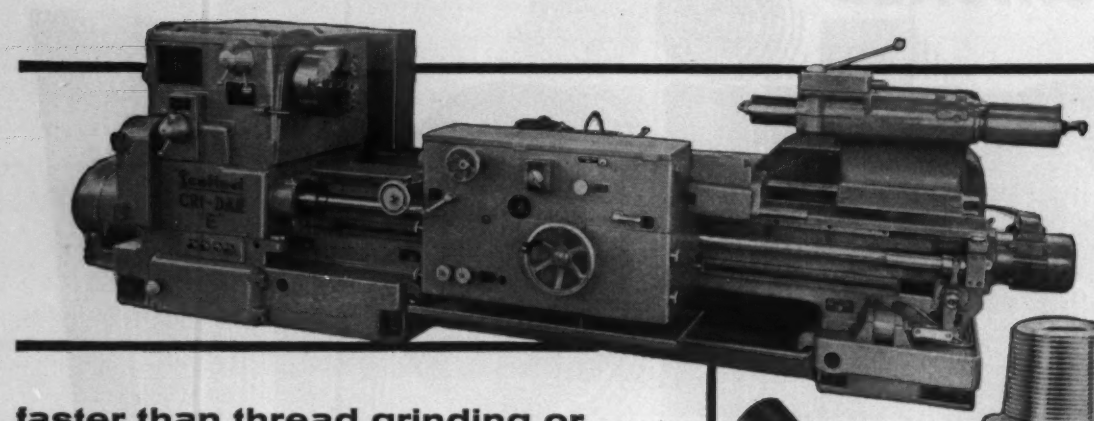

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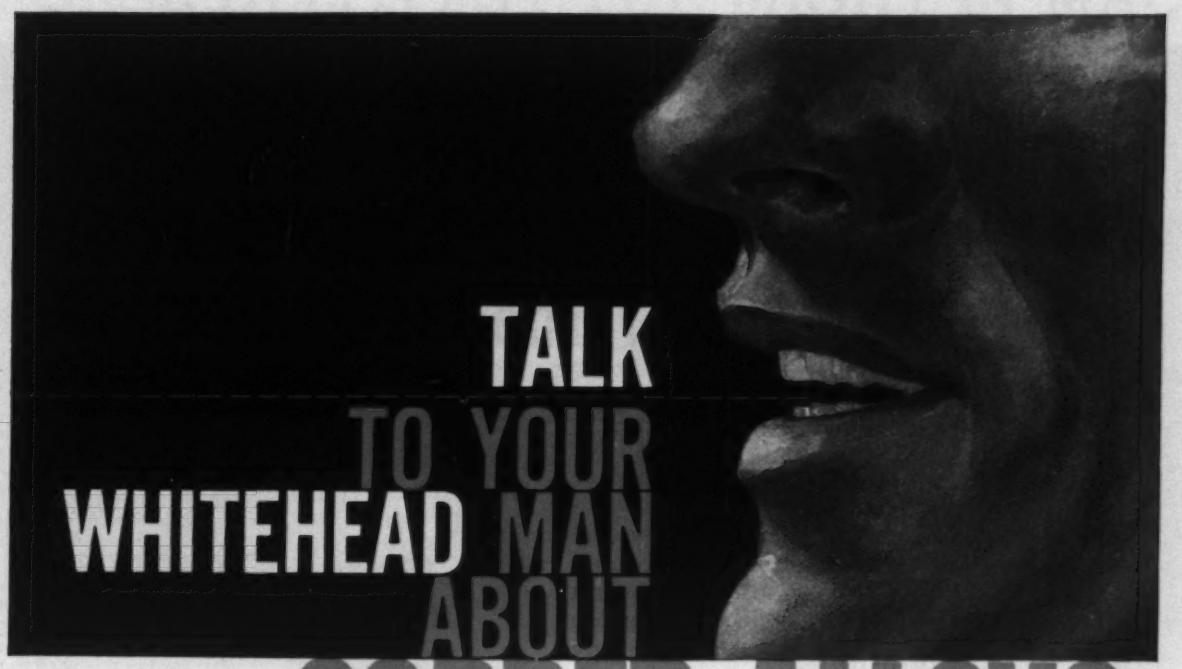

TALK TO YOUR WHITEHEAD MAN ABOUT COPPER ALLOYS

Brass, Bronze and many others are stocked in the forms you use

Copper is a key item in the Whitehead line. We maintain large stocks of Copper in many different alloys, such as Tough Pitch Copper, Yellow Brass, Muntz Metal and Tempaloy. You can get these products to meet MIL, ASTM, or other standard specifications.

Stocks of well over 1000 sizes of rod, pipe and tube, almost 500 items of sheet, thousands of fasteners and even twelve different sizes of a specialty item like round telescopic brass tubing, make Whitehead a true "Supermarket" of Copper alloys—no matter what your requirements.

Since we stock all the principal corrosion resistant metals—Aluminum, Clad Metals, Monel, Inconel, Stainless Steel and Plastics, too—we can and do give unbiased opinions on the right material to do the job. Anytime you need anything in the corrosion resistant line, you'll find it pays to call Whitehead first. Interested in Specification Numbers as they apply to Copper Alloys? Write for Publication B-34D.

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monolith-forming refractories

for all industrial furnace requirements

Harbison-Walker has more than two-score different castable refractories, plastic fire brick and ramming mixes of conventional classes and various modifications especially adapted for new specific uses. In composition they span all the usual refractory oxides, stabilized natural and synthetic minerals, from the most definitely acid to the most strongly basic. These chemical properties, together with the physical characteristics in the combinations best suited for severe operating conditions provide the refractories for maximum economy.

In accordance with the best practice for the particular purpose, Harbison-Walker monolith-forming refractories are installed by various methods—such as pouring or tamping, troweling or gunplacement—depending upon the product and its application. For many purposes, they are used for complete linings free of joints, for maintenance in making both small and very large patches. Special shapes for emergency or prompt needs can be fabricated for immediate use.

Gunning H-W castables saves maintenance time and increases furnace availability.

Casting H-W Extra Strength Castable in this flue arch cut construction costs 25% and gained 4 days' production time.

HARBISON-WALKER REFRACTORIES CO.

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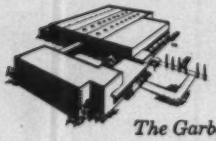

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Longer lasting, faster cutting Morse tools give Mack smoother holes...increased production...long-range economy.

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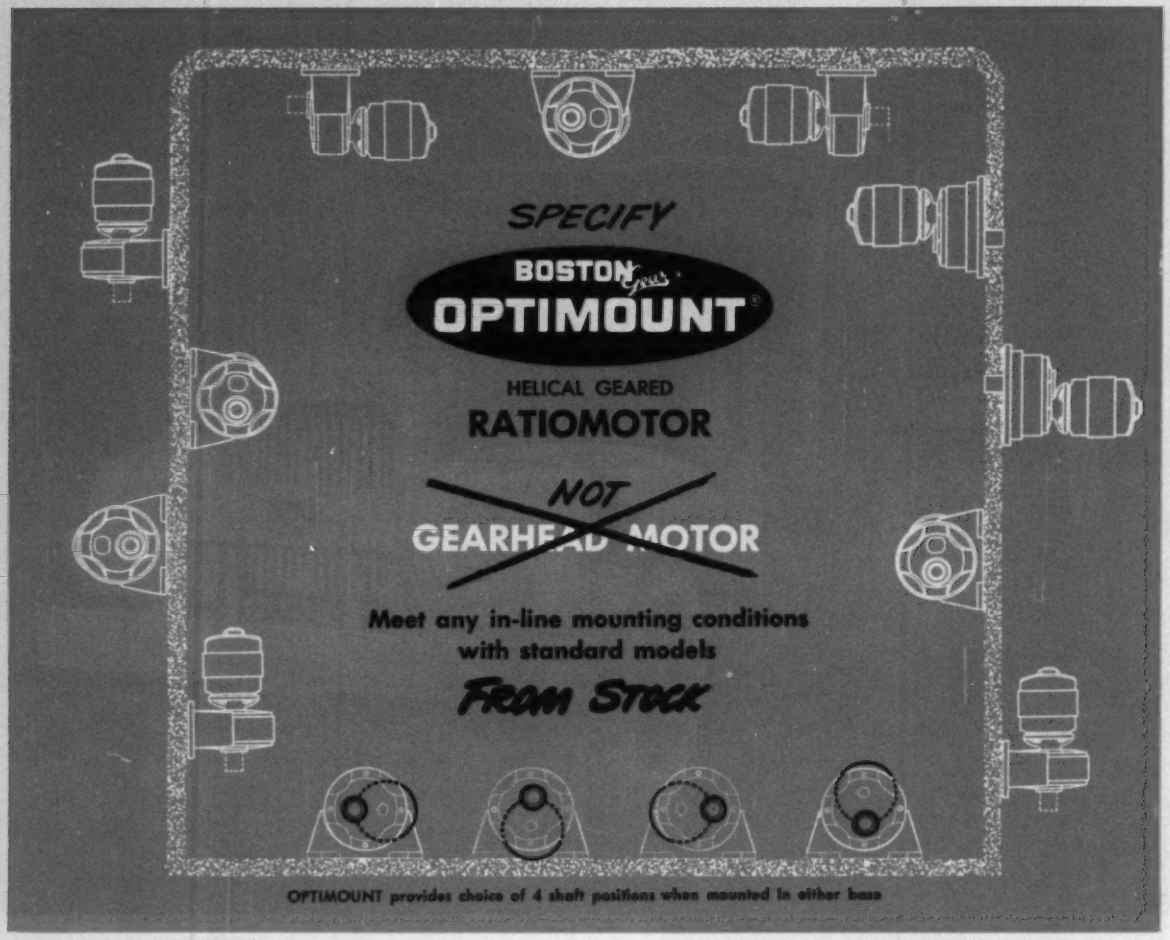
How to keep in-line drives in line with today's cost-reduction demands



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OPTIMOUNT Ratiomotor adaptability opens up endless opportunities for highest efficiency in drives once restricted by the mounting limitations of gearhead motors. With OPTIMOUNT optional mounting, you can choose from 456 combinations and get the arrangement you want, ready to install, FROM STOCK.

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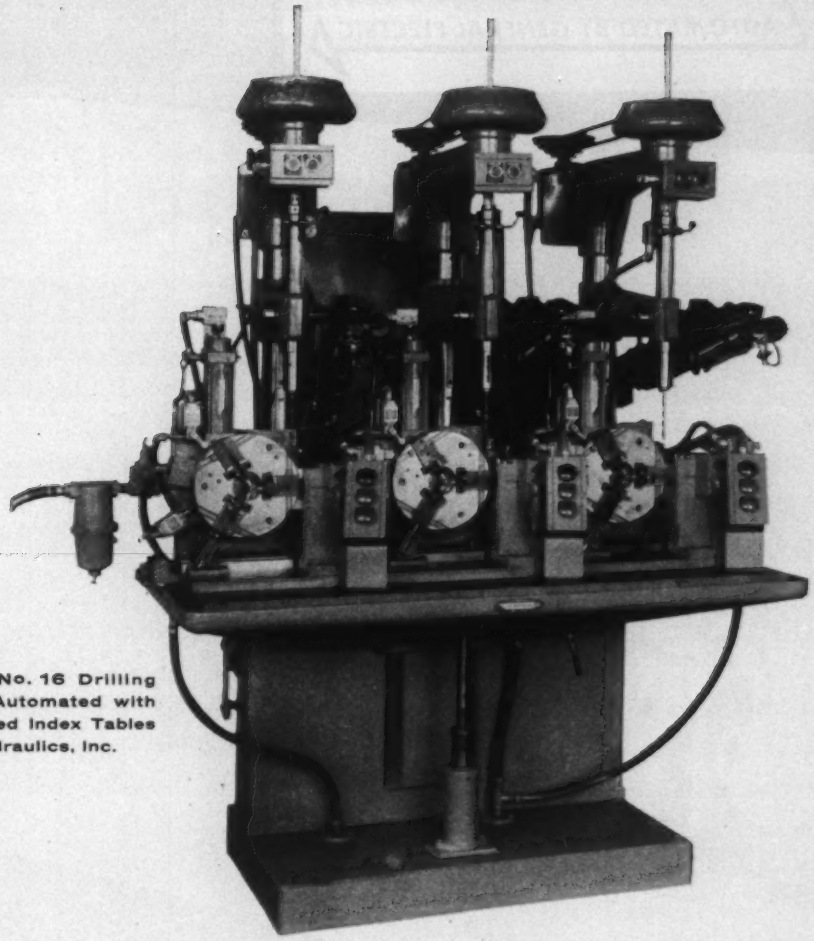


"Buffalo" No. 16 Drilling Machine Automated with Air-Operated Index Tables by Air Hydraulics, Inc.

8 YEARS OF SATISFACTION MADE THIS SALE!

Nothing sells a product like customer satisfaction. Here's proof:

Eight years ago a large mid-western manufacturer bought a "Buffalo" No. 16 Drilling Machine. It proved to be an excellent production machine. Quantity and quality of output were high. The No. 16 stood up to the punishment of continuous production with a minimum of maintenance.

This year the manufacturer decided to automate certain drilling and reaming operations. Because of eight years of complete satisfaction, a new 3 spindle "Buffalo" No. 16 Drilling Machine was specified.

The mechanism for automating the "Buffalo" Drill was designed and built by Air-Hydraulics, Inc. of Jackson, Michigan. Air-Hydraulics used its Model "H", 10" dia. Air-Operated Index Tables. The automated operation was drilling and reaming three lug-holes on the work piece.

The production rate was originally estimated at 150 pieces per hour. Air-Hydraulics reports that the actual production rate is 215 pieces per hour.

Here's a case of "three-way" satisfaction, with "Buffalo" Drills. Both the manufacturer and Air-Hydraulics are satisfied. And we are happy that our customer's satisfaction dictated the choice of a new "Buffalo" No. 16 Drilling Machine for this automation job.

For this kind of complete satisfaction, why don't *you* specify "Buffalo" Drills? Contact your "Buffalo" machine tool dealer, or write us direct for full information.

BUFFALO FORGE COMPANY

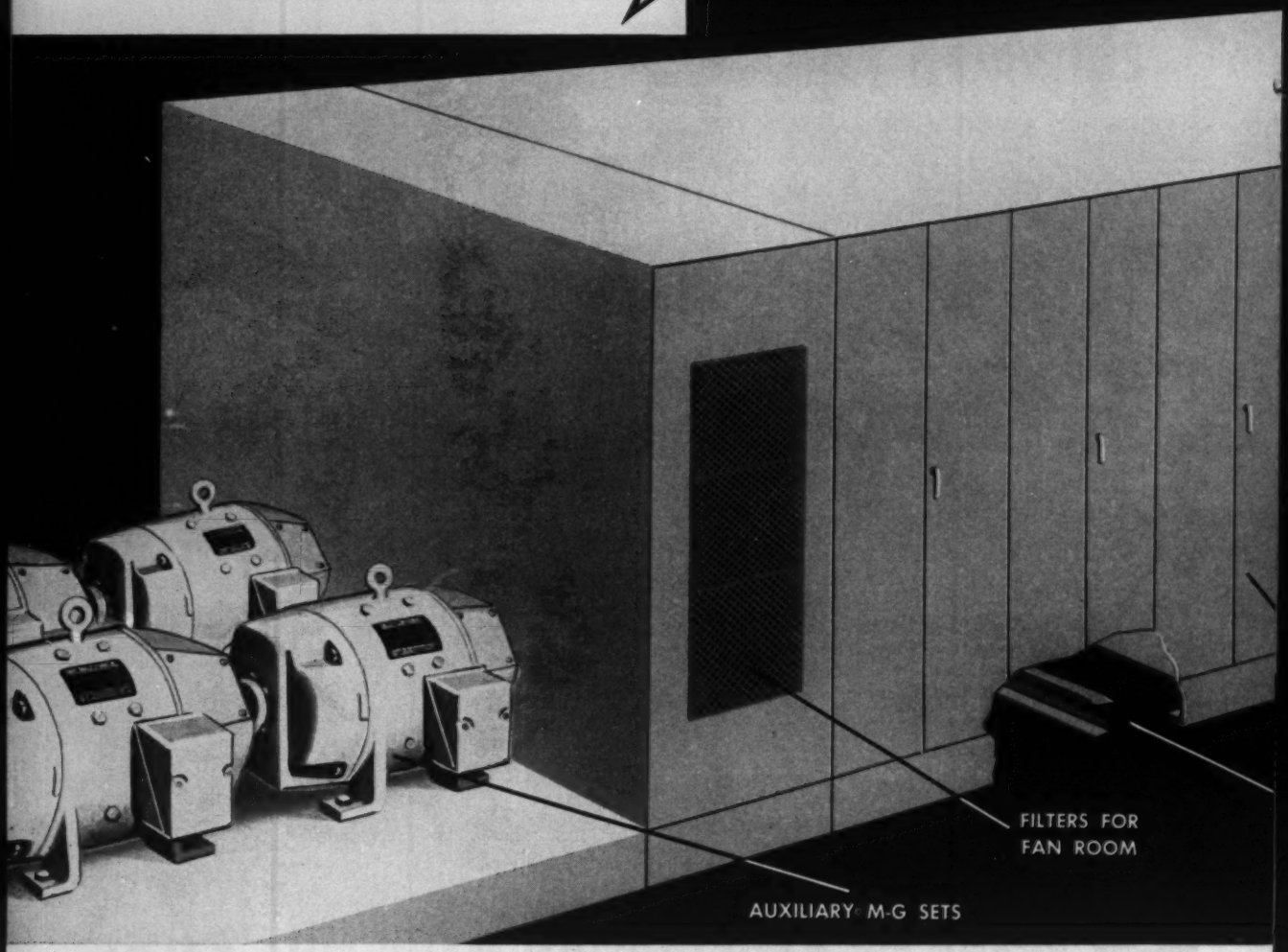
158 Mortimer Street Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

FOR QUALITY... PRODUCTIVITY ... PROFIT

METAL ROLLING AUTOMATED BY GENERAL ELECTRIC



A NEW PRACTICE IN PROCESS-LINE CONTROL

G-E "packaged" motor-control rooms reduce

The latest innovation in modern steel-mill process-line control is General Electric's new "packaged" motor-and-control room. This novel design, developed jointly by General Electric and Jones and Laughlin Steel Corp., groups all controls and m-g sets into one compact centralized unit. The above unit will be installed at J&L's Aliquippa, Pa., works, as part of their continuing facilities-improvement program. Previously, the installation expense on this equipment often matched or exceeded the actual cost of the equipment. The new G-E motor-control room design cuts installation costs as much as 40 percent!

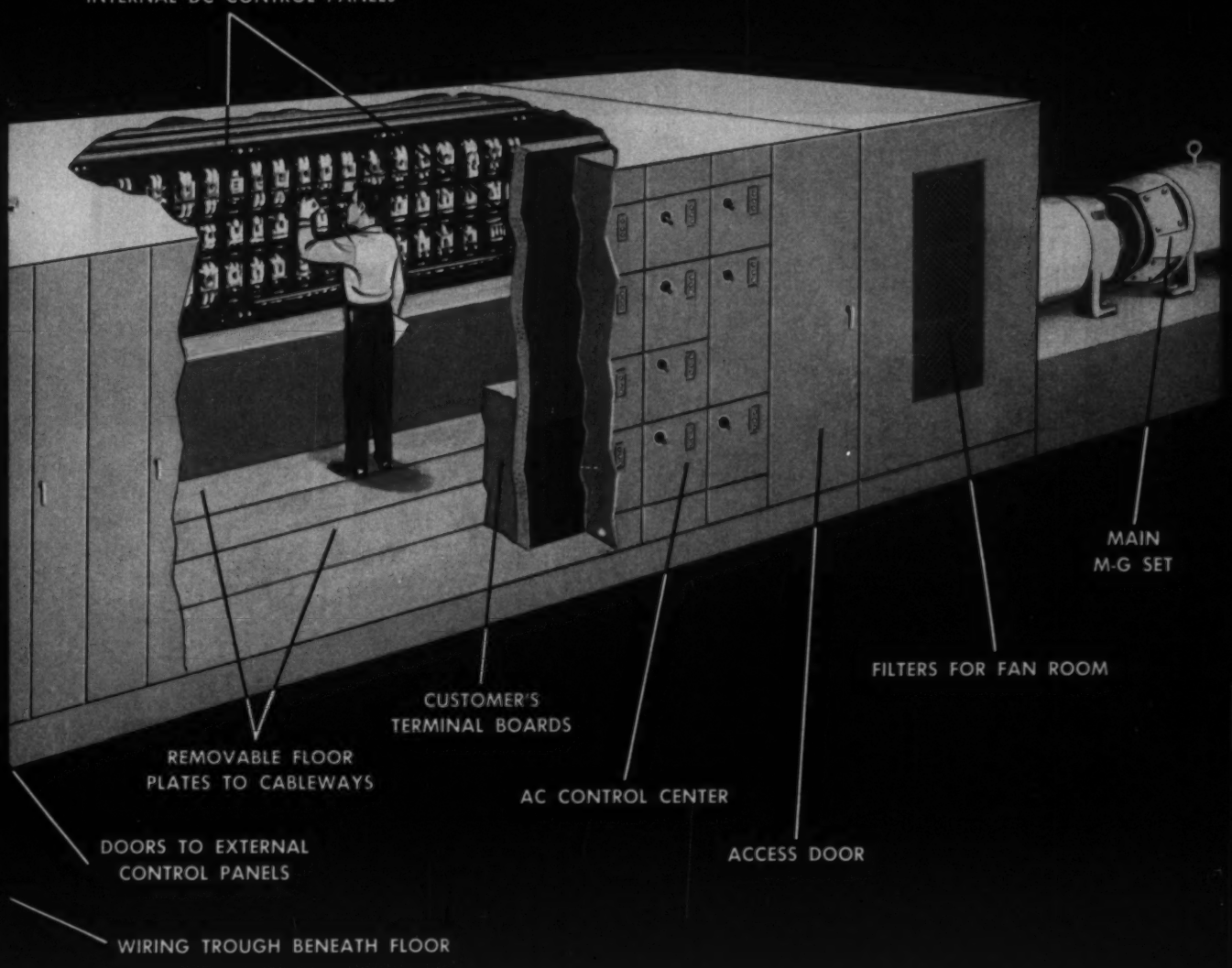
HERE'S WHY INSTALLATION COSTS ARE LOWER

Substantial savings on installation expenses can be realized through these features:

Independent control unit—The General Electric motor-control room is a completely co-ordinated, pre-assembled unit in itself, and in many cases, eliminates the need for a separate motor room. Since the motor-control room is self-contained, it may be located either near the driven equipment or in some previously unused area of the mill.

Field wiring is reduced by one-third or more—All internal connections are made and tested before the motor-control rooms are shipped. The only field wiring required is the connection of the power source and the leads to the operators' stations and the drive motors.

Construction engineering costs reduced—General Electric's grouped control concept enables the mill to know its conduit requirements much sooner. Thus, fewer,



installation costs as much as 40 percent!

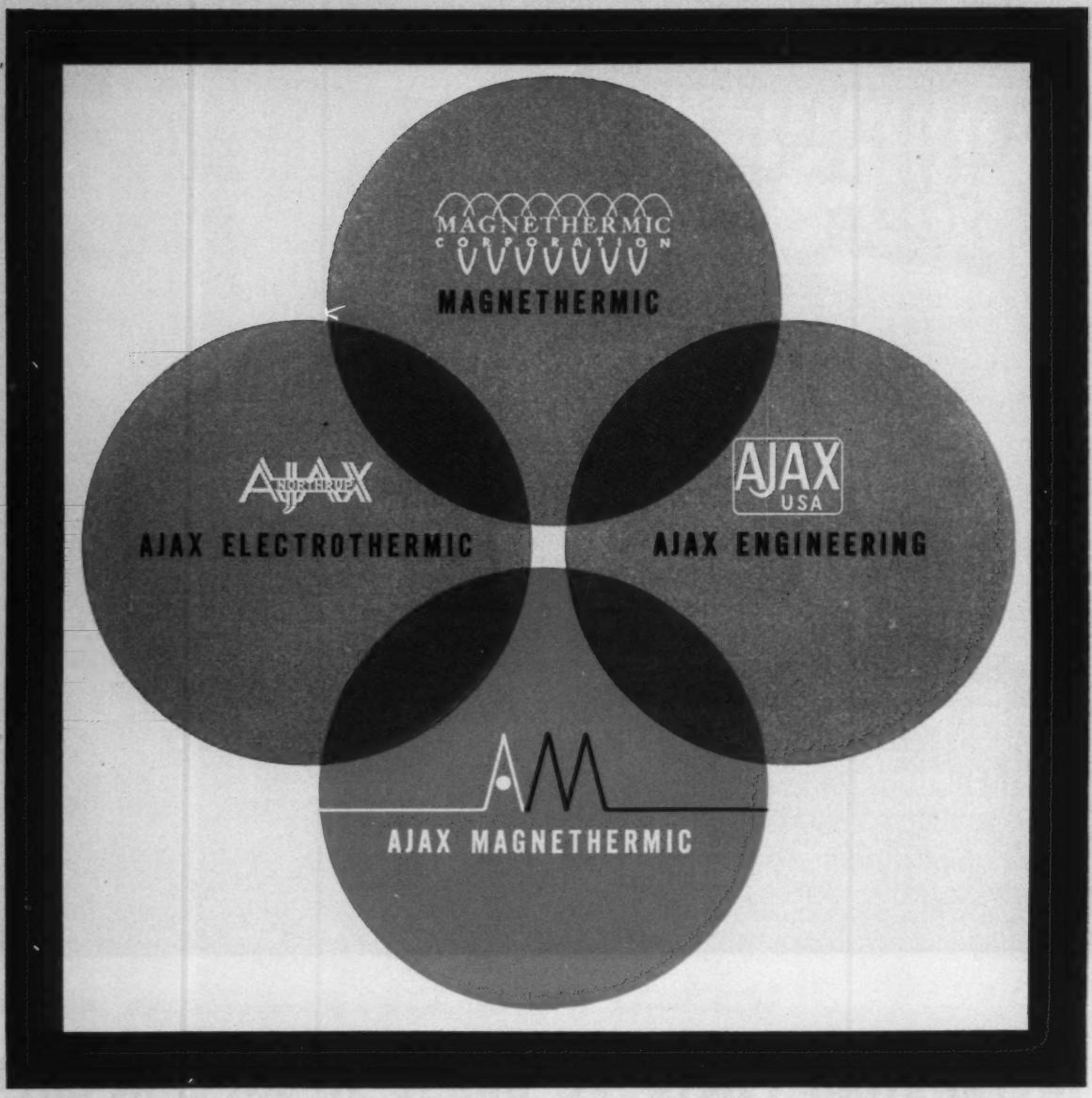
less-complex construction diagrams are needed, and actual construction can begin at an earlier date.

Common base minimizes installation time—This new "packaged" motor-control room, delivered on its own self-supporting platform, can be immediately set on a normal mill floor. It does not require expensive, specially-constructed foundations. With m-g sets built and shipped on a common base, the need to align them at the mill site is eliminated. In addition, regulating equipment is factory-tested prior to shipment, further expediting startup time.

For all the details on this new technique in process-line control, contact your G-E Sales Engineer today! General Electric Company, Industry Control Department, Salem, Virginia, and Direct Current Motor and Generator Department, Erie, Pennsylvania. 785-7

Progress Is Our Most Important Product

GENERAL ELECTRIC



THE NEW NAME WITH THE FAMILIAR RING!

This new name combines three old names of the Induction Heating business—Ajax Engineering, pioneer in 60-cycle melting; Ajax Electrothermic, pioneer in high-frequency melting; and Magnethermic, pioneer in Induction Billet Heating.
This old "new" company now offers the most complete line of Induction Heating equipment, the most experienced staff and the largest facilities of any manufacturer of Induction Heating equipment. This combination of experience, facilities and product line permits an unbiased evaluation of your heating or melting application.

"induction heating is our only business"

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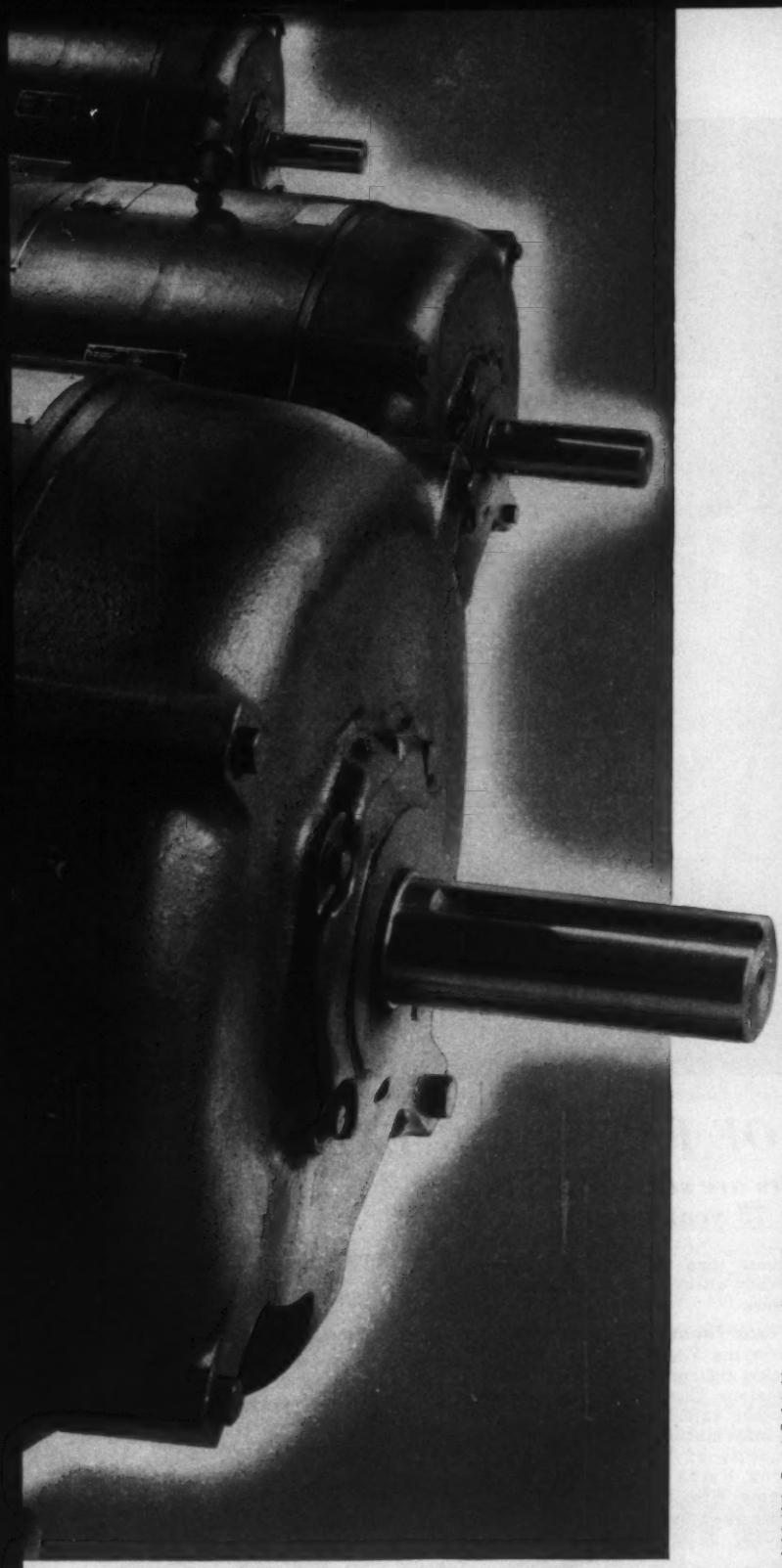

1960
16,450,000 horsepower
1965
26,000,000 horsepower

In the next five years demand by industry for motors to drive air moving equipment is going to increase about 60% . . . from 16,450,000 horsepower in 1960 to 26,000,000 horsepower in 1965. Other needs are rising even faster. Careful matching of motor to equipment will assure minimum shutdowns for repairs and maintenance. Century Electric application engineers can help you get that right motor by selecting from among the over 10,000 types Century makes.

All types of equipment—Take hard-to-start pumps and compressors . . . with Century Electric motors designed for this kind of application, starting is no problem.

Same thing holds true for fans, pumps, machine tools, ball mills, printing presses . . . Century Electric has the right motor for each.

Reliable operation—Bonded "Mylar" and high-temperature varnish insulation give tough mechanical strength and resistance to moisture . . . rigid cast iron or steel frames mean long life and quiet operation . . . rotors get special balancing tests before shipment to eliminate vibration and assure longer life. . . .

Application aid—To be sure you have the right motor for each application, contact your nearest Century Electric application engineer. He knows motors inside and out because he sells, applies and thinks motors day after day. For details on Century's complete line of motors, write for the Century Motor Application Guide, bulletin 270A. For *more* than a motor . . .

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

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Photo courtesy Ark-Les-Switch Corp., Watertown, Mass.

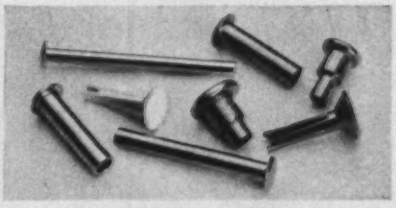
FREE...75 YEARS OF FASTENING EXPERIENCE!

All Thomson rivet customers are serviced by men backed by a company 75 years young!

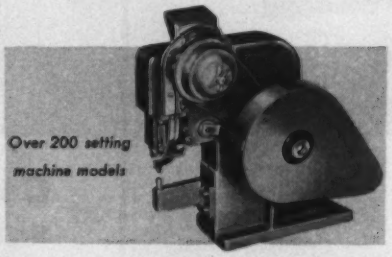
You get more per fastening dollar when Thomson becomes your fastening partner. You get on-the-spot service from a man who can tap a pool of experience no other source of rivets and rivet-setting machines can match.

Since 1885, J. L. Thomson Mfg. Co. has kept pace with fastening progress . . . continuously matching new rivets and automatic setting machines to product-improvement and cost-reduction demands. The result: more than 8,000 rivet specifications and more than 200 machine models . . . ready answers to your fastening problems.

Your local Thomson Fastening Man, listed in the Yellow Pages, can help you select the right rivet-and-machine combination. Thomson's new handbook is another valuable source of up-to-date information. For your copy of "Cost-Cutting Facts About Fastening With Rivets", address your letter to Dept. 325.



Over 8000 rivet specifications



Over 200 setting machine models

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Thomson (Canada) Rivet Co. Ltd., Gananoque, Ontario

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STAINLESS STEELS

The durable gleam of stainless steel flatware, utensils and kitchen accessories is mighty welcome. Today's homemaker knows and appreciates stainless for what it is—the *one* metal that always cleans fast and easy, never loses that *just-bought* beauty.

Specify Uniloy Stainless Steel. It's the high quality stainless that's easy to work and form. Made by one of the nation's leading specialty steel producers, Universal-Cyclops Stainless is rolled to your exact specifications.

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UC STEEL
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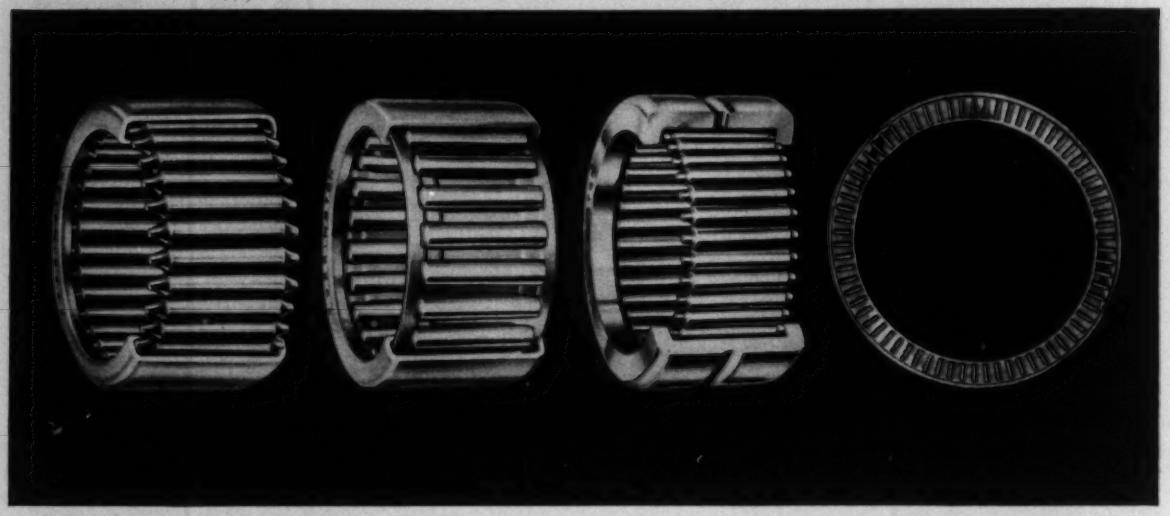
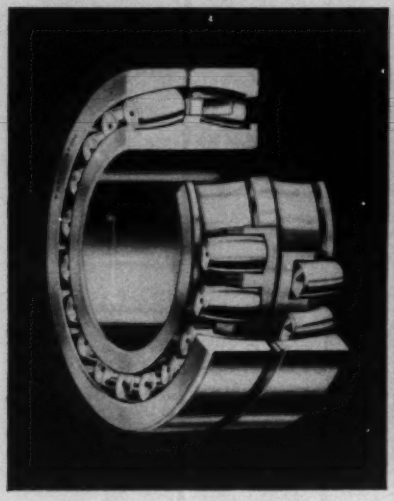
EXECUTIVE OFFICES: BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

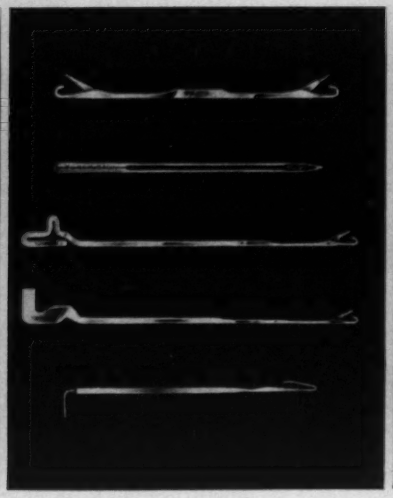
YES, TORRINGTON IS THE PIONEER MANUFACTURER OF THE REVOLUTIONARY NEEDLE BEARING...



BUT THIS, TOO, IS TORRINGTON...



Leading manufacturer of spherical roller bearings for rugged applications in the paper, steel, oil and construction industries



Since 1866 America's largest producer of precision-made machine needles for every need: knitting, sewing, tufting and felting

Originator of the rotary swaging process and largest manufacturer and user of rotary swaging machines in the world

In these and many other fields throughout the world Torrington is contributing to

PROGRESS THROUGH PRECISION

THE TORRINGTON COMPANY

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Designed and Built by

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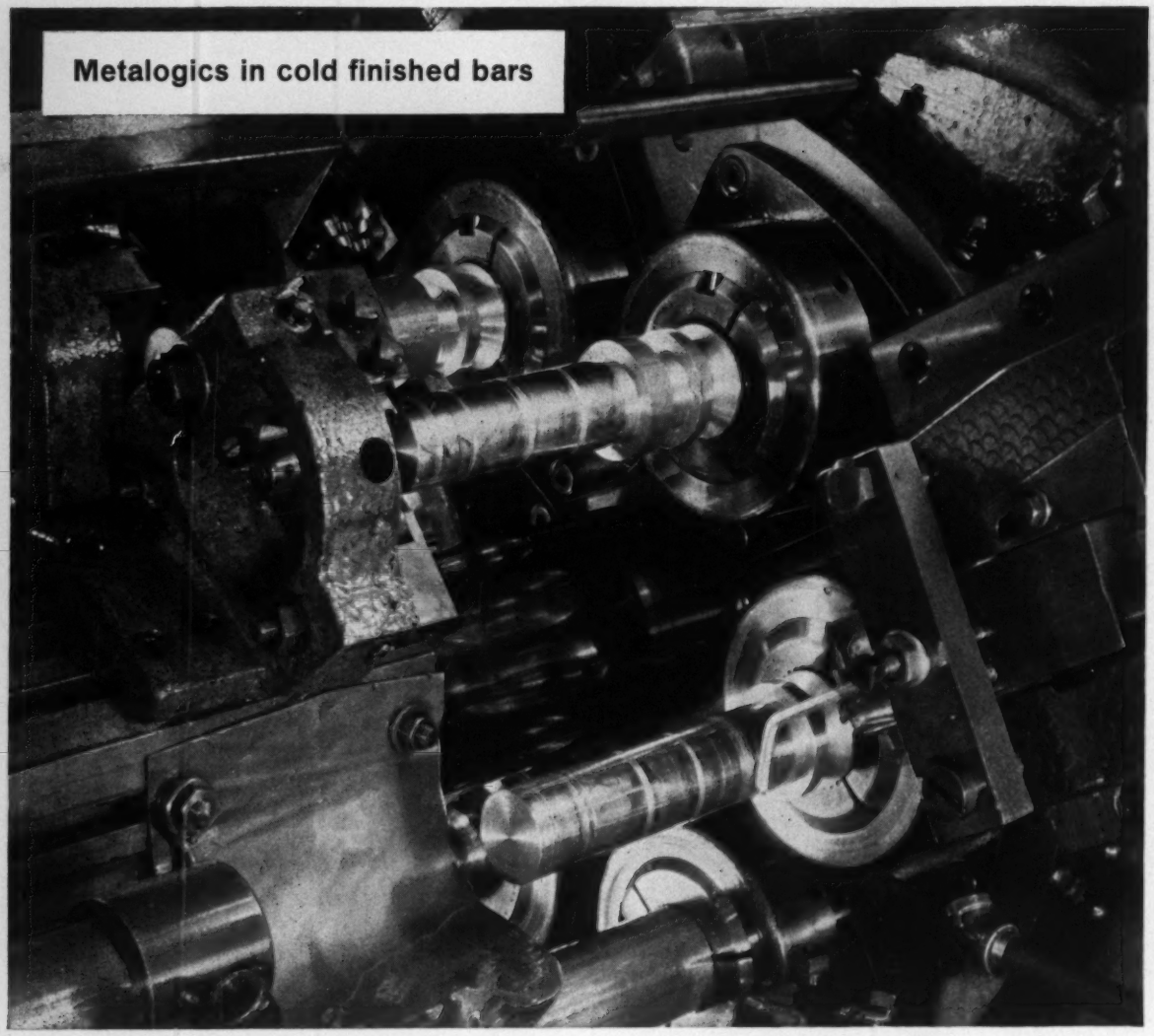
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

UNITED *can serve you no matter where in the world you are*



The big difference in Ryerson cold finished bars—

consistent machinability

When you buy cold finished bars from the nation's largest supplier of steel from stock—Ryerson—you can always count on optimum machinability with dependable consistency. Setup headaches, production snarls and rejects are reduced to a minimum because the rigid quality controls of Ryerson Metalogics assure uniformity of stock from one lot to another.

In addition to this consistency, Metalogics offers you unequaled service in depth. With 118 years of steel service experience, Ryerson has helped solve every conceivable kind of machining problem. And Ryerson stocks are the nation's largest, including even the hardest-to-get types and sizes. So Ryerson specialists are able to recommend the very best steel for any given application.

For consistent optimum results . . . plus on-time delivery, be "Metalogical"—call Ryerson.

METALOGICS
RYERSON PLUS VALUES

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

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Courting Your Gal—1980 Style

With your best girl, you are relaxing on the loveseat in your 1980 home. You pick up a box the size of a cigaret case and dial a number. The melodic strains of Gershwin's "Rhapsody in Blue" fill the room—which is now bathed in romantic blue light. She'd rather dance. So you dial another number: On a huge screen appears a 40 piece orchestra and you glide through a Viennese waltz. Later, you sip champagne (which you've ordered by dialing) while watching the newest stage show on the same giant screen. That type of luxury is found in the "music-conditioned home," a glimpse of 1980 offered by Stromberg-Carlson Div., General Dynamics Corp. The fantastic electronic system permits you to cue in hundreds of musical programs, movies, TV shows, art forms, communication methods, and special services.

Cresap of Westinghouse Urges Tax Law Change

Mark W. Cresap Jr., president, Westinghouse Electric Corp., asserts that the federal government must give industry an incentive to increase its support of basic research. He calls attention to the Curtis Bill (HR 4797), now before Congress, which would permit an income tax credit for contributions to basic research by nonprofit organizations and a smaller credit for work done in a company's own facilities. "This method of research support is more desirable, more effective, and less expensive than direct grants by government," says Mr. Cresap. It would give us an edge in the race with Russia.

You'll Travel More in '76

In 1976, there will be 114 million registered motor vehicles in the U. S. (an increase of 75 per cent compared with the present). They will be driven 1.2 trillion miles that year (a 93 per cent increase), consuming 97 billion gallons of fuel (a 94 per cent increase). So predicts the Bureau of Public Roads. It means we will have three vehicles for every four persons of driving age. The average vehicle will travel 10,562 miles in '76, using 855 gallons of fuel.

Two Researchers Forecast Applications for Thermoelectricity

A. O. Smith Corp.'s Dr. M. K. Blanchard believes thermoelectric devices to make possible the large scale conversion of heat into electricity will emerge in five to ten years. He also anticipates these thermoelectric products: Domestic heat pumping appliances, waste heat consuming devices, and scientific (black box) applications. He lists these "currently appreciated advantages" of thermoelectric products: No moving parts, silence, stability, long

life, and ease of control. Physicist William Brennen of Armour Research Foundation says the key to commercial feasibility of thermoelectric products is the development of more efficient materials. He is trying to fashion a material for use in high temperature (1500 to 2700° F) generators, which would use heat from nuclear reactors to furnish power for space vehicles, submarines, and other military apparatus. For a report on thermoelectricity's potential, see STEEL, Feb. 29, pp. 57-60.

How to Keep Supervisors Happy

Front line supervisors should have a chance to add 20 to 30 per cent to their base pay through incentive plans, asserts Richard C. Smyth, president, Smyth & Murphy Associates, New York consulting firm. Such plans will motivate a man to a sustained high level of performance, he believes. He thinks bonuses are most effective if paid annually (so they aren't regarded as part of the regular salary) and if the checks are personally presented by top management. And supervisors should be paid straight time for overtime work, he says.

Steel's Employment Costs Hit Record

Employment costs for hourly employees in the iron and steel industry last year climbed to a record $3.798 an hour, the American Iron & Steel Institute reports. Payroll cost per hour equaled $3.417; fringes added another 38 1 cents. Total employment in the industry averaged 515,057. But if the strike months are disregarded, average employment equals 609,320.

How to Improve Long Range Supply of Scieneers

Dr. D. J. Hughes, nuclear physicist, examines the new generator used in accelerating particles to more than 95 per cent of the speed of light. He is one of 16 top scientific authorities participating in a series of ten films, dubbed "Horizons of Science," that has been prepared by Educational Testing Service, Princeton, N. J. Aim is to interest high school students in science careers. ETS is asking industry to buy the films for high schools. Alcoa, Kennecott Copper, Texas Instruments, Ingersoll Rand, and other firms already have.

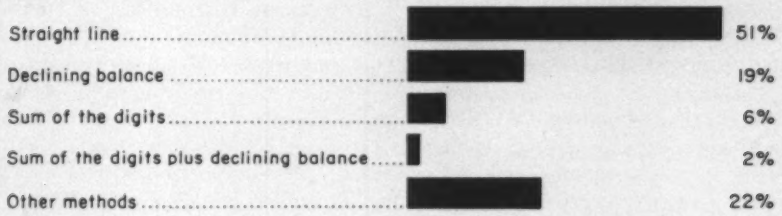
U. S. Businessmen Battle to Build Philippine Steel Plant

Seven U. S. businessmen met in the Philippines last week to try to convince government and industry leaders there that U. S. firms are the logical choice to build the islands' first integrated steel mill. A German trade mission is trying to get the job for its industry. Koppers Co., Pittsburgh, submitted the basic design for the plant, which would produce 253,000 tons of finished steel products annually. Other U. S. companies involved: Westing-

house International, General Electric International, Baldwin-Lima-Hamilton Corp.

How Companies Depreciate Office Equipment, Furniture

A survey of 1500 companies just completed by the National Office Management Association, Willow Grove, Pa., reveals that the majority of companies use a straight line depreciation method for office equipment and furniture. Here's the percentage of firms using each depreciation method:



Why Companies Standardize on Office Equipment

A survey of 1500 companies by the National Office Management Association shows that most companies have standardization programs for office machines. NOMA asked why, got these answers: 38 per cent said "interchangeability"; 15 per cent mentioned "simplification of service"; 15 per cent listed "ease of operation"; 8 per cent said standardization reduces training; 8 per cent noted operator preference. Other reasons cited: Lower maintenance costs, better attention from suppliers, improved appearance, higher trade-in values, advantages of size and portability. Other highlights of the NOMA survey: 1 in 5 companies rents office machines . . . 32 per cent have formal replacement policies for machines . . . 87 per cent carry service contracts.

Sarnoff Predicts 250% Jump in a Major Electronic Market

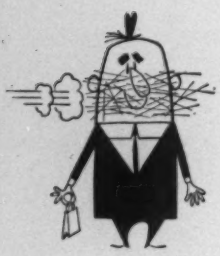
Look for sales of commercial and industrial electronic products to soar 250 per cent above the present level by 1965. That's the prediction of Brig. Gen. David Sarnoff, chairman, Radio Corp. of America, who expects sales of computers, controls, and communications equipment to jump from the present $2 billion annual level to $7 billion in '65. He thinks the industry's total volume will hit $25 billion (vs. $14 billion now). He believes electronics will garner 20 per cent of the defense budget in '65 vs. 16 per cent now. Home entertainment sales will rise $2 billion to $8 billion, he says.

RCA Executive Sees Merger of Science and Engineering

There's a mounting trend toward the merging of engineers and scientists on research projects. Harry R. Wege, vice president, Radio Corp. of America, gives the Ballistic Missile Early Warning System as an example. (RCA is

prime contractor to the Air Force on BMEWS.) For that program, the firm formed a team of many types of engineers plus chemists, physicists, metallurgists, and mathematicians.

Straws in the Wind



Nearly half the members of the National Association of Sheet Metal Distributors are handling imported products, a survey finds . . . Two New England toolmakers told STEEL last week that the do-it-yourself market for twist drills has been almost completely cornered by foreign firms . . . Money gets tighter: In February, the supply of loanable funds dropped to its lowest level since April, 1934, reports the Alexander Hamilton Institute . . . The Army gave Chrysler Corp. a $12 million contract for 180 M-60 tanks . . . "Railweight," a new way to weigh freight cars, was unveiled last week by International Railroads' Weighing Corp., Chicago, which says the method will cut weighing expenses 80 per cent and increase speed by about 7 per cent . . . America's investor-owned electric utilities are working on 26 nuclear projects (worth $650 million) for 1.8 million kilowatts of power, reports Elmer Lindseth, president, Cleveland Electric Illuminating Co. . . . A New York State assemblyman, Harold Altro, says the Army Corps of Engineers will survey a route in Niagara and Erie Counties (New York) for an "all-American canal" to eliminate "bottlenecks in the Welland Canal" . . . The Tariff Commission has refused to recommend to the Senate any steps to protect the domestic fluorspar industry. That could be a blow to hopes of the lead-zinc industry which has a similar case before the commission . . . Construction outlays in February climbed to $3.6 billion—a record for the month, estimates the Commerce Department.

Steelmaker to Build Giant Vacuum Melting Furnace

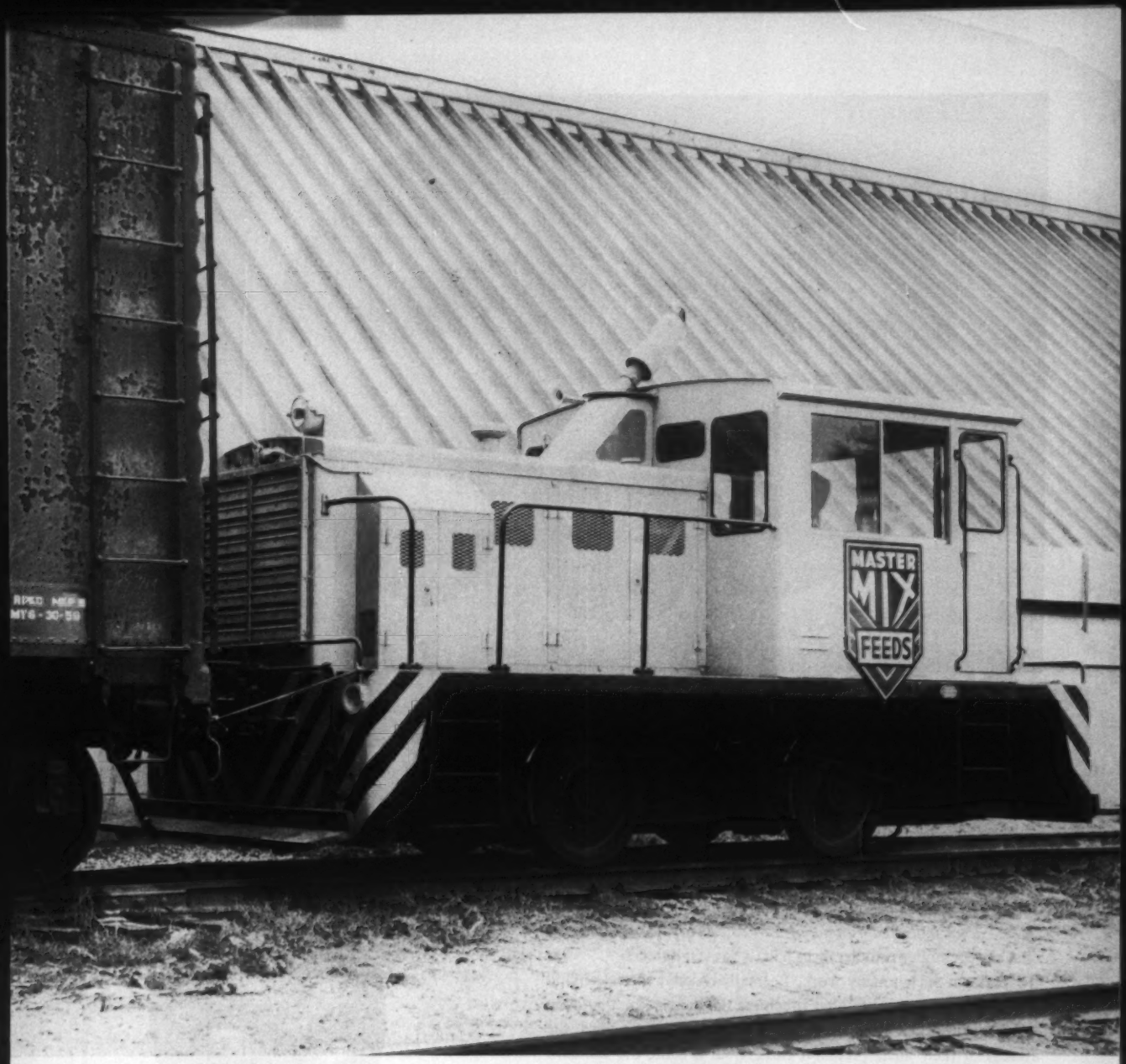
Allegheny Ludlum Steel Corp. will build a vacuum melting furnace at its Watervliet (N. Y.) Works which it says will be "the world's largest." The furnace is to produce ingots up to 50 in. in diameter and "at least twice the weight of any vacuum melted ingots now being produced commercially," says the company. Lectromelt Div., McGraw-Edison Co., will build the furnace. Allegheny Ludlum says it will make larger forgings and plates available to producers of aircraft, missiles, and rockets, and it "should lead to expanded civilian markets for vacuum melted materials."

Metalworking Pulse

Steel: In the last five weeks, ingot production has been maintained at rates yielding between 2,650,000 and 2,690,000 tons per week. **Autos:** Schedules are being continued by automakers at rates to keep dealers' inventories from getting out of hand. Sales aren't up to expectations, but they're ahead of the rate for recent years. **The Business Trend:** STEEL's index has declined 7 points since the peak of the poststrike uptrend (week ended Jan. 23). It may drop more.

- **INDUSTRIAL PRODUCTION**
  - Week ended Feb. 27 .... 178†
  - Year ago 165
  - Details on Page 67
- **PASSENGER CAR PRODUCTION**
  - Week ended Mar. 5 .. 154,000*
  - Year ago 133,540
  - Details on Page 64
- **INGOT PRODUCTION RATE**
  - Week ended Mar. 6 ... 93.1%†
  - Week ago 94.4%
  - Details on Page 135

†Preliminary. *Estimated.



25-ton Plymouth Diesel used by McMillen Feed Mills moves up to 13 carloads of wheat, corn, soya beans or barley, on a single haul.

"Averages about 1 Gallon Of Fuel Per Hour," by actual Record

"Economical to operate and extremely easy to maintain" is the way officials at the Marion, Ohio, plant of McMillen Feed Mills—Division of Central Soya Company, Inc.—sum up the operating advantages of their 25-ton Diesel-powered Plymouth Locomotive.

"We use our M-Series Plymouth for switching, spotting and hauling jobs—operate up to 22 hours per day in peak seasons," says John Secoske, Elevator Superintendent. "Our Plymouth handles every car at least 3 times, moves 13 fully loaded units, or 20 empties, over level stretches—takes 8 cars up our incline. In 2 full years of operation, it has averaged about a gallon of fuel per hour of operation. Downtime, including routine servicing, has amounted to less than 10 hours per year—much less than with the equipment previously used."

Plymouth's high operating efficiency and low operating cost make the movement of material more profitable for large and small companies everywhere. For complete information on a Diesel or gasoline-operated Plymouth built specially to meet your haulage needs, send a brief outline of your operations to: The Fate-Root-Heath Company, Dept. A-1, Plymouth, Ohio.

RAIL POWER

PLYMOUTH® LOCOMOTIVES

WITH TORQOMOTIVE DRIVE

ALSO BUILDERS OF F-R-H CERAMIC MACHINERY

PLYMOUTH LOCOMOTIVES in Progressive Industry throughout the world

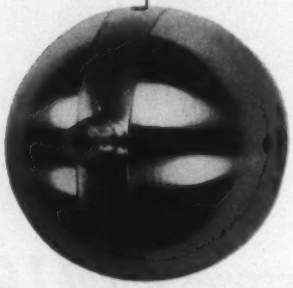
PRECISION:

Beryllium specialists, Leemath Incorporated of Long Island, create delicate and precise mechanisms in this high strength but toxic and abrasive wonder metal. In their temperature-controlled shop, this feather-light gyro float assembly (shown actual size, right) was turned on a special high-precision LeBlond Dual-Drive Lathe. *Spherocity had to be concentric with the two major axes within .0005" total indicated runout of 1.8750"!* (To hold the assembly that close, component tolerances had to be even tighter!)

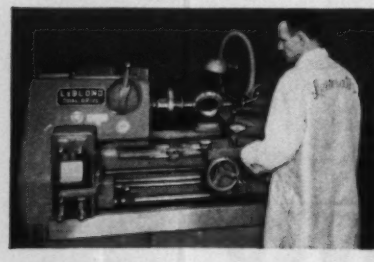
To perform such touchy work, Leemath ordered their LeBlond 15" Dual-Drive to ultra-high precision standards. For this lathe Timken furnished specially-made bearings with one-third the runout of their finest precision class. With it came the standard features that give LeBlond its reputation for long-lived precision —combination gear-belt drive headstock with 16 speeds, 31 to 2400 rpm; compensating vee bed way construction with hardened steel shears; thrust-lock tailstock; and many more.

People buy lathes for many reasons. But when, like Leemath, they must have precision they can depend upon, that is reason enough to buy LeBlond.

If you would like to have the full story of LeBlond's Dual-Drive, ask your distributor or write for Bulletin 6A.



Reason enough to buy LeBlond



THE R. K. LeBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio

LeBLOND of Cincinnati

Fighting Back

An ordinary deckhand on a U. S. lake freighter makes more money than the captain of a foreign ship.

And that's just dandy from the traditional American point of view. Higher wages, to most of us, mean a higher standard of living. It's something in which we have always gloried and boasted about.

But there is another side to the philosophy of ever increasing pay: For example, domestic iron ore is being priced out of the market by wages paid to lake bulk fleet workers and to iron ore miners.

From almost total self-sufficiency in that most basic raw material, we have moved to a point where almost half our supplies (Page 50) come from outside the U. S. In part, of course, that is due to the desire of steel plant operators to supplement dwindling Lake Superior reserves by developing outside sources. In the pursuit of that objective, it became apparent that excellent ores could be obtained from the outside sources at costs well below those for domestic ores.

As automatic, annual inflationary cost increases continue, the cost advantage of foreign ores becomes more obvious. Iron ore has become a world commodity. Lake Superior's golden days are gone.

Many ore miners in that district and many workers on the lake fleets will find their jobs have been exported.

Thus iron ore joins the ranks of manufactured products hurt by low wage foreign competition. The same factors which are hurting American machine tools, automobiles, and scores of other metalworking products are hitting that basic raw material.

The realization of how much hurt we are taking dawns slowly because we have had it so good for so long. The danger lies in not taking remedial action while there still is time.

What are the Lake Superior ore companies doing about their problem?

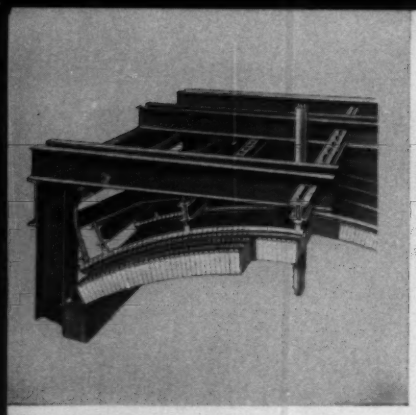
They are taking the action recommended for all industries:

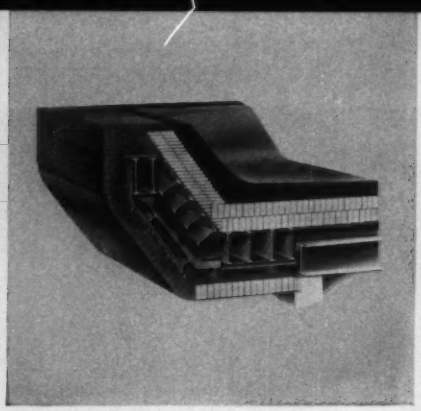
They are stressing quality . . . tailoring their product to the customers' needs . . . emphasizing service . . . intensifying their technological research . . . seeking new methods and equipment to increase their production and transportation efficiency . . . explaining the economic facts of life to their workers.

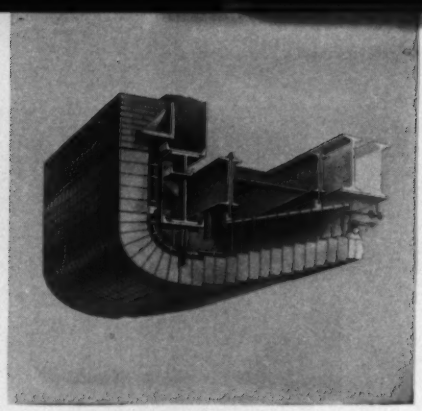
They are fighting back.

Walter J. Campbell

EDITOR







① HELD-UP, HELD-DOWN ROOF

- No roof centers to install.
- Easily hot-patched—Brick layers do entire job. No welding, no cutting.
- Pipe-supported—No special supporting members required.
- Inexpensive hangers—Simple, one-piece wire.
- Standard wedge brick—Wider bearing surfaces. More stability.

② INTERCHANGEABLE SUSPENDED CHILL WALL

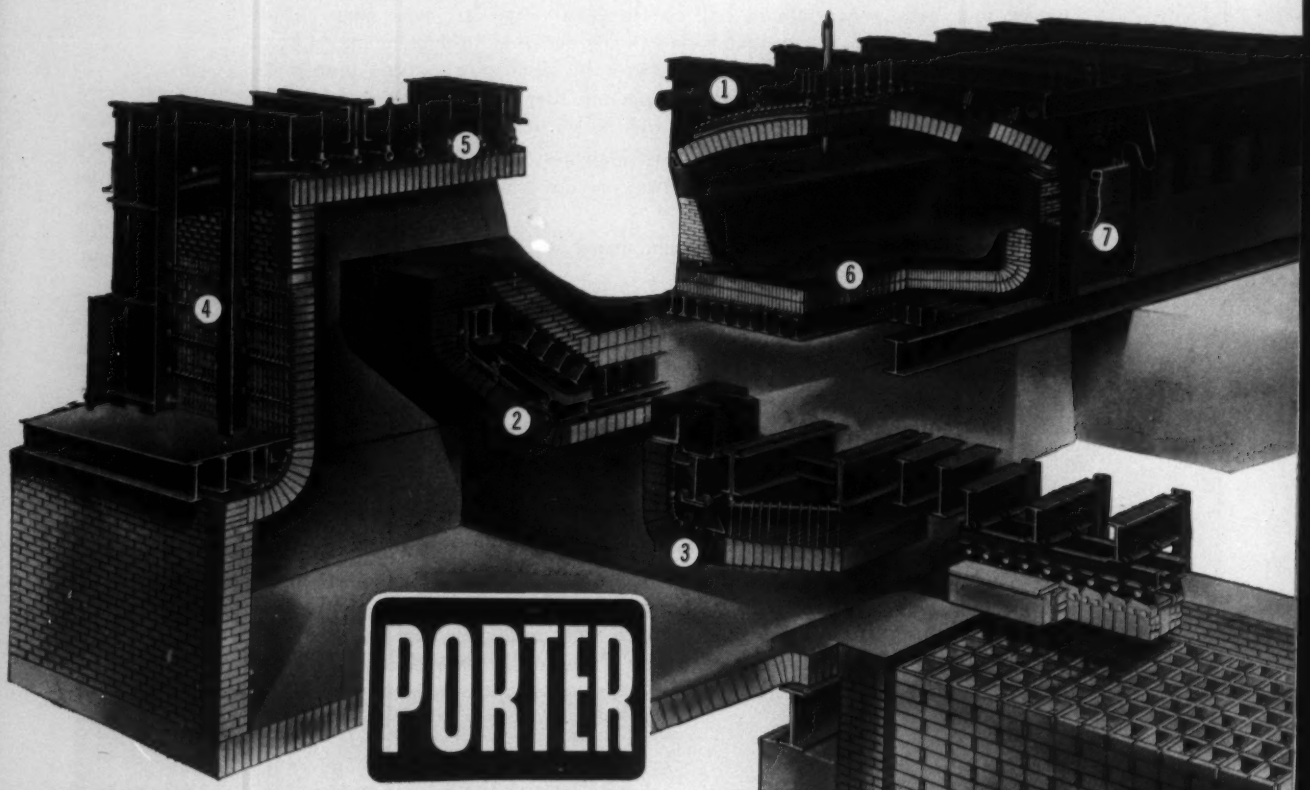
- Low cost, simple installation—Adaptable supporting structure.
- Greater expansion flexibility—Tile engaged on bed joints.
- Safe load distribution—Self-supporting castings.
- Tightly sealed joints—Tongue-and-groove clay tile.

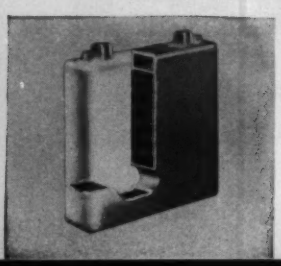
Brick recommended: Either MC-70 Cladex or interchange with Peerlac, 60% alumina.

③ INTERCHANGEABLE FAN TAIL

- Pipe-supported—Easily replaced with standard mill supply stock.
- Low-cost, simple installation—Adaptable supporting structure.
- Greatest strength—Fabricated steel nose supports.
- Higher heat resistance—Alloy hangers.
- Tightly sealed joints—Tongue-and-groove clay tile.

Brick recommended: Either MC-70 Cladex or interchange with Peerlac, 60% alumina.



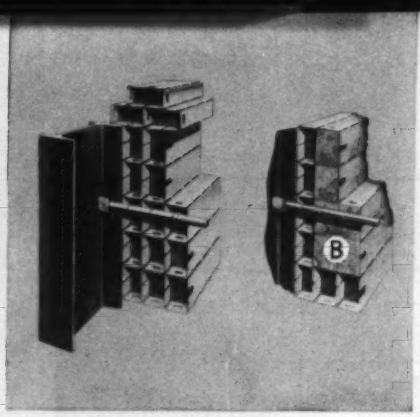


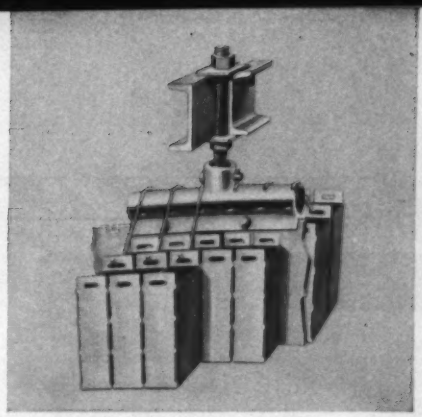
⑦ WATER COOLED OPEN HEARTH DOOR

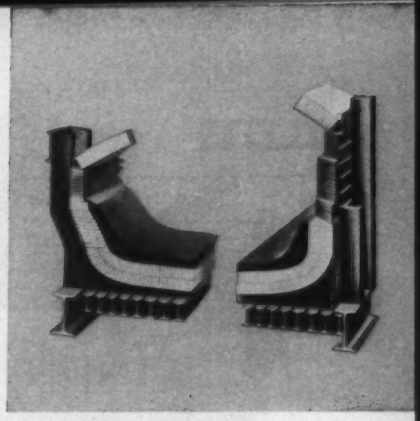
- Long life—Easily installed, easily replaced.

Recommended: Porter Plastikrom for door lining.

* Patents applied for
† T.M. applied for







4 ENDWALL CONSTRUCTION

- Air-cooled tabs (4 sides of brick)—More heat conduction for more efficient cooling.
- Refractory reinforcement for hot spots—Extended casings* permit adding refractory material on cold face (B) as hot face wears.
- Cladding with Porter Cladex†—Dimpled construction of casings provide mechanical spacing for expansion.
- Basic strength—Porter construction eliminates need for tie plates.
- Ties and pipe easily reclaimed.
- Simple one-piece hangers—Wall can be dismantled without cutting or burning.

Brick recommended: MC-70 Cladex or other specified chrome and magnesite compositions.

5 AIR CLEANED, AIR COOLED*, TAB SUPPORTED ROOF BRICK

- Built-in air cleaning—Covers entire roof. No hand blowing.
- Controlled cooling over any area—for controlled wear.
- Tab support—Simple, inexpensive.
- Air-cooled tabs—More heat conduction for more efficient cooling.
- Positive support—Tie plate anchored to pipe.
- Inexpensive hangers—Simple, one-piece wire.
- Notched tie plates—Slip into place. Easily installed or replaced.

Roof brick recommended: CM-40R Cladex or other specified chrome and magnesite compositions.

6 HEARTH CONSTRUCTION

- Monolithic subhearth—Formed by Subhearth Kromform. Easy to install. Perfect conformation.

Brick recommended for inverted arch bottom: Porter M-90B, or other specified chrome and magnesite compositions.

Ramming mix recommended for working bottom: Porter Magnaram 95 for highest MgO content. Or Magnaram 85.

Brick recommended for back wall: MC-70 Cladex. Also other burned and unburned chrome and magnesite compositions.

Brick recommended for front wall: MC-70 Cladex in standard and special jamb brick. Also available burned or unburned chrome and magnesite compositions.

Announcing the Porter All-Basic Furnace—industry's most advanced all-basic open hearth roof

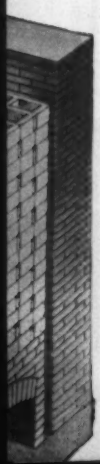
both suspension and refractories by Porter

It's here in detail . . . the Porter All-Basic Open Hearth!

A new concept in roof and endwall suspension employing the present fundamental construction now in use. Both incorporate a new, *all-metal cladding* method to provide proper expansion allowance throughout the entire system.

The suspension system and the basic refractory materials are designed to work together . . . no guesswork regarding either. There is no division of responsibility; Porter is your complete source.

For more information write *Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*



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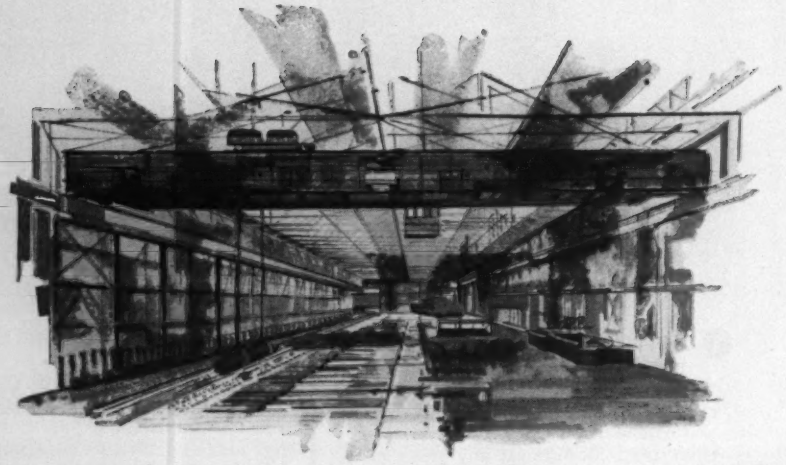

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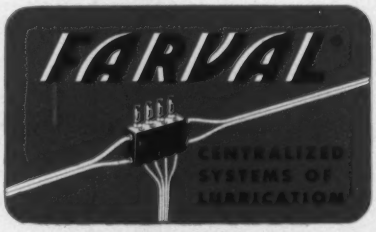
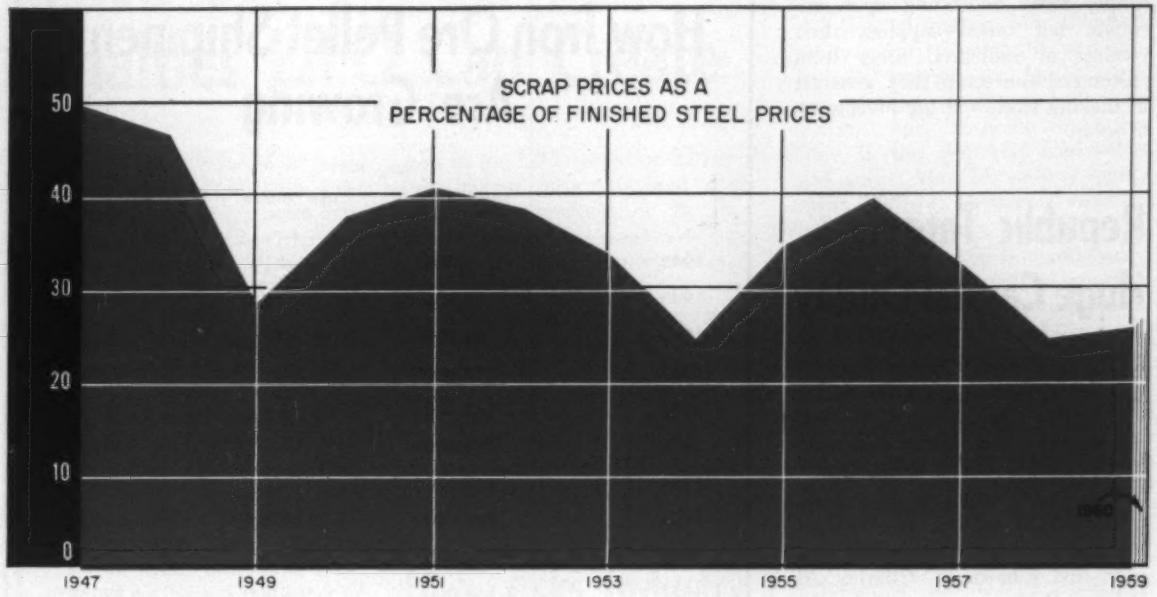




What the Scrap Price Drop Means

MOST metalworkers have doubts about the value of a change in scrap prices as a major barometer of business. But the $4.67 tumble in the composite price over the last two weeks has prompted some uneasy inquiries: What does it mean?

STEEL checked with steel mill scrap buyers, brokers, and dealers for an answer. The consensus:

1. Tremendous scrap inventories in the hands of consumers plus the outlook for lower steel mill operations in the second and third quarters are the major immediate forces pushing prices downward.

2. Business optimism for 1960 has been tempered (primarily by other indicators, see STEEL, Feb. 29, p. 47), but prospects for the year are still good.

3. Improved steelmaking technology and adequate capacity for pig iron are forcing scrap prices down from the abnormal highs of the immediate postwar period to more "normal" levels—see chart.

4. We may be entering the "maturity" cycle of the scrap industry. The speculative philosophy (buy low and hold it until prices go up) of operation is giving way to a more businesslike approach. The end result will be less severe price fluctuations.

• **Record Stocks on Hand**—Stocks of scrap in the hands of consumers in January totaled 8.9 million gross tons—the largest on record. During the steel strike, consumption was cut sharply, but scrap generation continued at a high level. With the mills having a big inventory, the natural supply-demand forces set in when they began revising their estimates of operations for the second and third quarters.

Scrapmen consider pig iron their chief competitor. Blast furnace capacity has increased, and the use of taconite pellets, sintered ore, and more oxygen has boosted furnace efficiency and lowered pig iron costs. Some mills are reportedly using open hearth charges of 70 per cent hot metal and 30 per cent scrap.

• **Stability Ahead**—Many observers feel that the speculative opportunities of the scrap industry are disappearing. With mills being less dependent upon scrap, industrial scrap going direct to the steel mills will tend to play a more important part in setting prices. Scrap dealers will have to mechanize and improve their operations to compete with that price.

"Take out the violent price fluctuations," says one scrap industry spokesman, "and you may see a trend toward long term (six months to a year) contracts entering the picture."

• **Prices**—How far will prices drop? What's a "more normal" price for scrap? Neither buyers nor sellers will risk a guess. But most admit that when scrap sells at 50 per cent of the base price of finished steel—(as it did during 1947)—the price is too high. Currently, the price of scrap is about 18 per cent of the steel price.

Further price drops are expected. Some big mills reportedly could

operate for several months without buying any dealer scrap. It would simply mean depending upon adequate hot metal supplies, their receipts of industrial scrap from customers, the scrap they generate in making steel, and big inventories of scrap.

Republic Targets Huge Capital Outlay

REPUBLIC Steel Corp., Cleveland, will spend more than $159 million for capital improvements in 1960, the biggest capital outlay ever made by the company in a single year.

This year's outlay is part of Republic's $375 million, five year efficiency program announced last year by Chairman Charles M. White. Projects programed for this year include:

Installation of hot strip finishing facilities and a 48 in. continuous heavy gage strip galvanizing line at Republic's Warren, Ohio, plant; an additional battery of coke ovens and a plastic coating line for steel pipe at the Youngstown plant; relocation and rehabilitation of the 8 in. bar mill at the Canton, Ohio, plant; a block of additional soaking pits at the Buffalo plant; special heat treating facilities at the Chicago plant; a new battery of coke ovens and coal chemical producing facilities and additional soaking pits at the Gadsden, Ala., plant.

Construction has already begun on the company's new 56 in. hot strip mill at Warren, and 134 in. plate mill at Gadsden. Funds have also been appropriated for improvements at several of the company's coal mines in Pennsylvania and Kentucky.

Republic's spending program, while aimed primarily at improving efficiency, will also add 330,000 tons in basic steel ingot capacity. In Warren, handling equipment in the open hearth department will be improved, adding 192,000 tons of annual capacity. In Gadsden, one open hearth furnace is being enlarged, boosting annual capacity 138,000 tons. Republic's capacity at the beginning of the year was 12,742,000 tons.

How Iron Ore Pellet Shipments Are Growing

Gross tons

	From U. S. Plants	From Canadian Plants	Total, North American Plants
1948	1,000	—	1,000
1949	3,000	—	3,000
1950	82,000	—	82,000
1951	217,000	—	217,000
1952	163,000	—	163,000
1953	499,000	—	499,000
1954	663,000	—	663,000
1955	868,000	231,000	1,099,000
1956	4,461,000	375,000	4,836,000
1957	6,254,000	566,000	6,820,000
1958	8,452,000	864,000	9,316,000
1959	8,322,000	1,081,000	9,403,000
Totals	29,985,000	3,117,000	33,102,000
1960*	13,350,000	1,350,000	14,700,000

*Estimated. Source: John J. Craig, vice president, Technical Services Inc.

Another record will be set this year by pellet shipments. Seven North American plants are producers; two more to ship in 1960

IRON ORE PELLET shipments will continue their climb to new records this year.

John J. Craig, vice president, Technical Services Inc., Cleveland, estimates pellet shipments from North American producers will total 14.7 million gross tons. U. S. producers will supply 13,350,000 tons, and Canadian plants will provide 1,350,000 tons.

• **More Records Coming**—Growing use of the high grade materials for blast furnace feed will push production of pellets in the U. S. and Canada to about 30 million gross tons in the next three or four years, Mr. Craig is certain. Output may far exceed this figure if the concentration plants under construction or in the pilot stage in Quebec install pelletizing facilities.

Pellet shipments began with 1000 gross tons in 1948. Total shipments through 1959 amounted to 33,102,000 tons (see accompanying table). They had a natural iron content varying from 61 to 66 per cent and averaged about 62 per cent, Mr. Craig reports. Although 1959 shipments of 9,403,000 tons set a record, the total would have been around 13.5 million tons had there not been a steel strike.

• **Grows Fast**—From 1948 to 1954, pellet production was entirely from pilot plants. Beginning with 1955, four commercial plants went into operation, and shipments increased rapidly. In 1959, seven commercial plants were operating. Four are in the U. S. and three are in Canada.

Two additional U. S. pellet plants are to come into operation this year, and one next year.

Illinois Survey Highlights Penalties LIFO Can Create

LIFO users who are forced to liquidate inventories (as during a steel strike) may get some tax protection. Rep. Noah Mason (R., Ill.) has submitted a bill (H.R. 6014) to the House Ways & Means Committee calling for the relief.

The congressman has also instigated a survey by the Illinois Manufacturers Association. Returns to a questionnaire are still coming in, but an analysis of replies from ten typical firms using LIFO shows: They have incurred $1.25 million additional tax liabilities because of inventory liquidation during the prolonged steel strike. One small company stands to have $30,000 added to its tax bill. The bite would exhaust its working capital.

Survey returns are being forwarded to the Treasury Department which is preparing its recommendations to the Ways & Means Committee. The Mason Bill seeks to allow companies to refigure tax returns and wipe out the phantom profits created by the involuntary liquidation caused by labor disputes.

• **More Activity**—The American Institute of Certified Public Accountants is also getting into the act. In a letter to Rep. Wilbur Mills (D., Ark.), chairman of the Ways & Means Committee, it asked that Congress recognize other uncontrollable events likely to create reduction in LIFO inventories.

Says the AICPA: "There are many situations where inventories are liquidated by causes beyond the control of management—floods, fires, strikes, shipping delays. The result is an unnatural increase in income in which the company may resort to artificial business actions, such as deferring shipments, making abnormal purchases, or changing its taxable year.

• **Business Byproduct**—One foundry executive recently told STEEL: "Ours may be a unique situation, but we were definitely able to trace our January-February drop in business to the LIFO problem. Three of our biggest customers had overbought our products in the final quarter of 1959 in an effort to compensate for the inventory drop in steel supplies."

A Chicago accounting firm reports that less than a third of its clients use the LIFO method. "And the degree to which they were hurt varies with the extent to which they use LIFO—many firms have only certain products on LIFO. Some are hit pretty hard."

U. S. Asks Industry About Export Aid

THE GOVERNMENT is taking steps to help U. S. industry boost its exports. It'll meet with representatives of 40 industries "to obtain firsthand advice on specific moves" it could make.

The sessions will be run by the Bureau of Foreign Commerce and Business & Defense Services Administration of the Commerce Department. Machine tool builders will be in Washington tomorrow (Mar. 8). The remainder of the schedule:

Industrial heating, Mar. 29; automotive, Apr. 5; scientific and professional instruments, Apr. 12; iron and steel (rods, bars, rolls, and shapes), Apr. 19; home appliances, May 3; iron and steel (ferroalloys and wire), May 10; railway equipment, May 17; electronics, May 24; industrial fasteners, May 31.

Appearance is by invitation only. Industry executives will be requested to state what foreign restrictions on U. S. exports they would like to see reduced. Other categories to be discussed include: Overseas trade centers for the display of U. S. goods; the need for expanded credit; and the best way to disseminate information on export opportunities to U. S. businessmen.

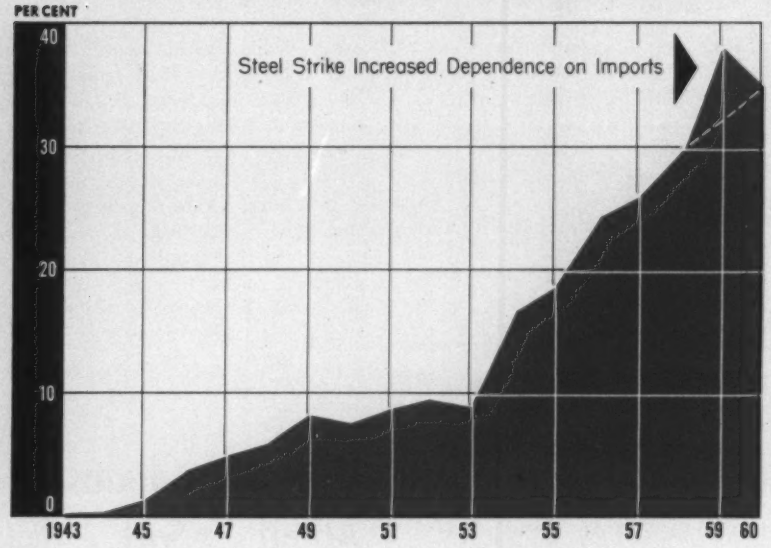
• **Coming Up**—The U. S. will participate in the GATT (General Agreements on Tariffs & Trade) meeting this fall at Geneva, Switzerland. Thirty-seven countries and several prospective participants will discuss the lowering of trade barriers.

The BDSA meetings will augment the coming public hearings of the Committee for Reciprocity Information. They are scheduled to allow interested parties to express their views of the position the U. S. should take at the GATT conference.

C-130 HERCULES, a giant troop-cargo carrier designed for short fields, is shown preparatory to its first flight at Lockheed Aircraft Corp.'s engineering flight center at Marietta, Ga. The ship can land with a ground roll as short as 460 ft. Note the 90 degree angle of the flaps. Allison load compressor engines have been added to pump a steady jet of compressed air over the flaps, ailerons elevator, and rudder to prevent stalling

U.S. Increases Dependence

A Third of Our Supply Comes from Abroad



FOREIGN COUNTRIES have taken one-third of the job of supplying the U. S. with iron ore.

The development has come rapidly. At the close of World War II, the U. S. was self-sufficient. Imports amounted to only a trickle. But they have grown by leaps and bounds in the last six years, and the top has not been reached.

Imports are gaining because iron ore is becoming a scarcer natural resource in the U. S., and it's cheaper to mine ore and transport it at the lower wage rates in foreign countries and in foreign ships than it is to pay the U. S. rates. (A deckhand on a U. S. ore boat is paid more than a captain on a foreign ore vessel.)

• **More Imports Coming**—A tonnage record will be set this year, even though imports will comprise a slightly smaller percentage of our needs than they did in 1959. Our 1960 requirements are expected to be at a record high of 135 million gross tons. From 33 to 35 per cent (44 million to 47 million tons) are expected to be imports.

The previous import record was last year's 36.5 million tons. That was 38 per cent of the U. S. consumption, which was held down to 95.3 million gross tons by the steel strike. Had consumption been higher, the 1959 percentage of imports would have not bulged out their steady line of growth. Instead of hitting 38 per cent, they would have been around 32.

• **Roll Call**—Canada and Venezuela are the two biggest suppliers. Of the 36.5 million gross tons of iron ore imported into the U. S. in 1959, Canada supplied 14 million and Venezuela, 12.9 million. The remainder was made up of 4 million from Chile, 2.8 million from Peru, 1 million from Liberia, 66,000 from Sweden, and 1,734,000 from scattered sources.

Canada and Venezuela began to loom large as suppliers in 1954, when they furnished 56 per cent of the imported ore. In 1959, they accounted for 74 per cent.

U. S. companies are the big figures in most of the foreign ore developments. They're seeking to assure an adequate supply of good ore for the growing U. S. iron and steel industry and to get ore at the lowest possible costs. Steelmakers are seeking every means to hold down production costs in a battle to compete with other materials and with steel imports.

• **Lid on Prices**—Merchant sellers of U. S. ore would be getting $2 a ton more for their iron ore were it not for the competition from imports. Domestic prices have been unchanged since 1956, and it's unlikely they'll go up this year. They have a tendency to move in unison with steel prices. No major price increases in steel are likely until after the steelworkers get an automatic wage increase next December. This will be after the close of the lakes shipping season in the Lake Superior region, from which most of the U. S. ore comes.

Wages of the U. S. iron ore miners are tied to those of the U. S. steel industry, so the wage cost trend in the U. S. iron ore industry is still upward.

The stimuli to expansion in foreign ore sources have been great enough to bring in new supplies faster and in much greater quantities than had been expected. Result: There is now an oversupply.

• **World Commodity**—Opening of many foreign fields of iron ore is making this raw material a world commodity. No longer is the price pegged to the supply and demand within the U. S. boundaries. Some of the ore from these new fields, including one in eastern Canada, is going to the iron and steel plants of Germany and other countries. Rapid growth in capacity and production of foreign steel plants makes them increasingly bigger factors in the demand for ore. In any economic appraisal of iron ore, you have to look also at the political climate of South America, Africa, and other countries, the complex ocean shipping situation, the price negotiations between the Germans and the Swedes each fall, and many other factors.

A Canadian mine that will ship its first ore this year is Inland Steel Co.'s Caland project at Steep Rock Lake, near Atikokan, Ont. For five

on Imported Iron Ore

years, Inland's mining subsidiary, Caland Ore Co. Ltd., has been dredging part of the lake to reach the ore. Shipment from the project is to start with the opening of this ore season. About 750,000 tons are expected to be moved out this year. Production will be increased each year until an annual rate of 3 million tons is reached in 1969.

• **U. S. Production Estimate** — While U. S. consumption of iron ore in 1960 should hit a record high (135 million gross tons), production of ore in the U. S. will be around 90 million tons—well below the output record of 117,995,000 tons set in 1953. U. S. iron ore production in the steel strike year of 1959 approximated 57 million tons.

The influx of foreign iron ore is pushing domestic producers (particularly merchant sellers) to try to remain in the competition by improving quality of ore shipped, improving service to their customers, and cutting costs.

• **Bearing Down on Costs**—One of the companies called its mining people together for a two day session on cost cutting. Some of their approaches may be: Intensified efforts on quality; more emphasis on sizing of ores and tailormaking grades to customer specifications; giving the best possible service to customers; more concentration on mining technology and research; study of all phases of transportation costs; and explanation of the iron ore mining situation to workers and their union.

The transportation cost study will include a look into conveyor belts, such as the one proposed several years ago for northeastern Ohio and a study of truck haulage vs. rail haulage.

Development of iron ore into a world commodity takes some of the seasonality out of this material. No longer is iron ore movement in the U. S. limited to the icefree months of the Great Lakes. South American and African ores can come into U. S. salt water ports the year around.

Other countries: 1.7 million tons.

In icefree months, ocean vessels can carry foreign ore via the St. Lawrence Seaway into the Great Lakes in competition with Lake Superior ores.

• **Lakes Season Near** — The Great Lakes shipping season is expected to get underway this year with no delay. The U. S. Weather Bureau at Detroit reports less ice on the lakes than at any time since 1953. First meeting of the ice committee of the Great Lakes fleet (assisted by the Weather Bureau, the Coast Guard, and the U. S. Corps of Engineers) is scheduled for the week of Mar. 15. The group will try to arrive at a safe date for start of lakes shipping.

There's no need to buck the ice this year. Steel companies have enough ore to run on. Foreign ore has helped keep them supplied.

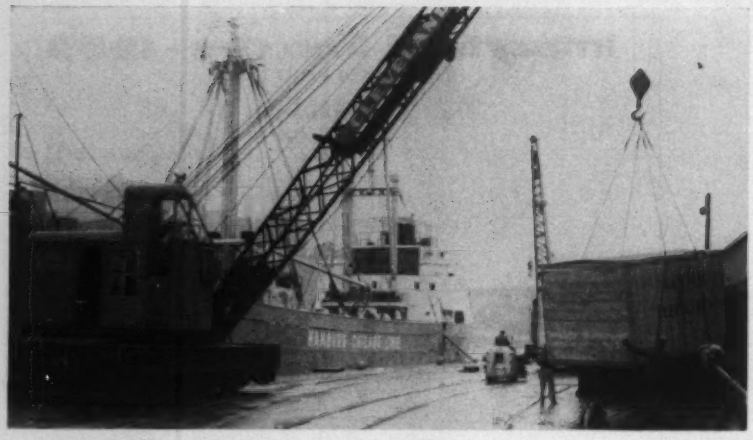
• **Enough for All**—Some consumers may run short of some grades, but a little borrowing from one another will prevent any emergency. A few users of ore say they are long on ore supplies and will have some for sale.

An expected softening in steel production will help stretch the ore supplies.

Despite the steel strike interruptions to the iron ore movement last year, U. S. stocks on Dec. 31 were only slightly below those of the corresponding date a year earlier (64,516,011 gross tons on Dec. 31, 1959, vs. 65,841,574 tons on Dec. 31, 1958). In contrast, the portion that was foreign material (except Canadian) jumped sharply—17,270,606 tons on Dec. 31, 1959 compared with 10,856,562 tons on Dec. 31, 1958.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Six Ways Seaway Can Help You Save



Seaway trade more than tripled activity at Port of Cleveland in '59

1. Lower shipping costs.
2. Faster delivery.
3. Lower cost packaging.
4. Quicker paperwork.
5. Fewer damage claims.
6. Speedier tracing.

WILLYS - OVERLAND Export Corp., Toledo, Ohio, shipped 3618 Jeeps through the St. Lawrence Seaway for $141,280 less than it would have cost to route them through East Coast ports. L. Keith Covelle Jr., vice president and general manager explains: "The $39 per unit saving in freight charges was passed on to the customer and helped strengthen Willys' position in a highly competitive overseas market."

Many other seaway shippers cite similar savings in 1959:

An Ohio machinery company—$12,000 on one shipment.

A Wisconsin maker of garden equipment—$10 to $12 per ton.

Harnischfeger Corp., Milwaukee—$5000 on one excavating shovel.

New Idea Div., Avco Corp., Coldwater, Mich.—$1000 on a farm equipment order.

A Buffalo firm—$465 on a 200,000 lb shipment of steel beams.

• **Faster Too**—In addition to freight savings of 10 to 25 per cent, many firms within a 100 mile radius of Cleveland report that deliveries to many foreign ports are speeded up by the seaway. "Delivery time is more controllable through the seaway," states M. H. Buehrer, vice president and general manager, Boice-Crane Co., Toledo. "We save as much as two to three weeks." A Cincinnati firm says it can put down a bottle uncasing machine in Rotterdam, Holland, faster, as well as cheaper, by using the "Eighth Sea."

• **Other Advantages** — An Ohio firm says it can use domestic packing rather than the more expensive export type. Reason: Handling is minimized when the seaway is used. This also means a reduction in damage claims, relates an exporter of automotive parts. H. C. Brockel, municipal port director, Milwaukee Board of Harbor Commissioners, adds: "Paperwork is expedited since travel time to a distant seaboard is eliminated or reduced. Tracing is also simplified."

• **Impact of Imports**—There's no denying that the seaway has helped to intensify foreign competition in domestic markets. But the situation has its reverse side: Some metalworkers are purchasing foreign materials and components to make their products more competitive. A small builder of machine tools in Toledo is using Swedish equipment to supplant a line of tools which had become too costly to produce here. It sells the machines under its own name.

• **Some Disillusioned**—But everything's not "coming up roses." A Chicago importer of Swedish specialty alloy and high carbon strip steels warns: "We'll have to cut our seaway shipments to Chicago if service isn't improved." Reason: He can't get his steel off Chicago piers. The port doesn't have adequate handling facilites, especially for long bars, he explains.

A Cleveland firm found it took longer to ship cylinders to South America via the seaway than it would through New Orleans, and freight charges were about the same. A. T. Romanski, Export Parts Div., Thew Shovel Co., Elyria, Ohio, reports: "Our foreign distributors request that we ship through the seaway because it saves them money. But the seaway has not affected our business to any great degree. If we use it more, we may find more benefits."

• **Problems Cited**—Lack of reasonable railroad and truck rates for inland hauls to seaway ports is "our biggest problem," cites a Clevelander. He also notes a shortage of experienced longshoremen.

• **Progress**—New tieup walls at the Welland Canal will increase its capacity by 25 per cent. The U. S. Corps of Engineers says that deepening all harbors and channels to 27 ft from Duluth to the Atlantic will be completed by June 30, 1962. Most harbors have increased capacities and handling facilities.

• **1959 Review**—Last year, traffic through the Montreal-Lake Ontario section of the seaway rose to 20.4 million cargo tons, a 73 per cent increase over the 1958 level. Although the biggest jump was in upbound traffic (it reached 10.9 million tons vs. 4.7 million tons in 1958, while downbound traffic increased only to 9.5 million tons from 7.1 million tons), a terminal manager suggests a lot of it resulted from the steel strike. Example: 148,229 tons of bars, sheets, and manufactured iron and steel came up the waterway in 1959. Only 34,291 tons went down.

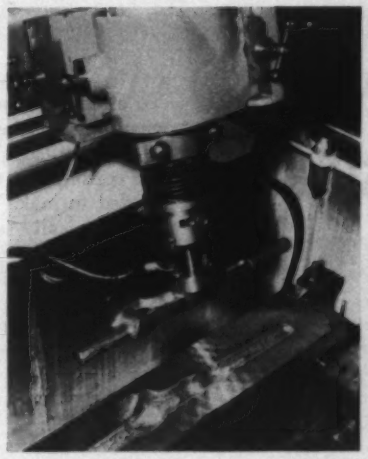
• **1960 Outlook Bright**—Opening of the seaway by Apr. 1 appears possible if late winter cold snaps aren't too severe. Milwaukee, which handled 200,000 tons of cargo last year (1958 figure: 65,000 tons), sees continued gains in cargo volume and port efficiency. Duluth predicts its general cargo will triple, and bulk handlings will double.

Cleveland expects its port to handle at least 300,000 tons this year. Last year's tonnage: 200,000 tons, triple the 1958 figure. Cleveland and Chicago will handle heavy government surplus machinery which formerly went through East Coast or Gulf of Mexico ports. Despite a squabble between public and private factions over waterfront land use, Detroit expects to double its 1959 tonnage.

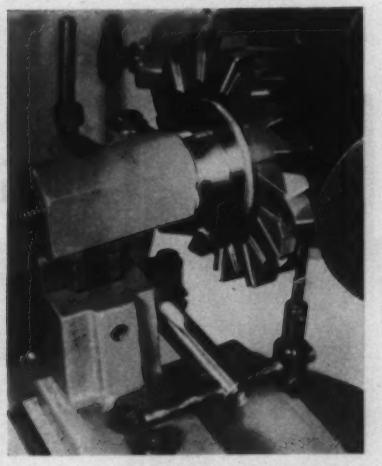
Chicago, the seaway's leading port, Buffalo, and Toledo, are also optimistic. Toledo's overseas traffic rose 276 per cent last year, to 114,914 tons from 30,597 tons in 1958. Sour note: Shippers of general cargo to European ports face a 10 per cent fare boost this spring.

Despite growing pains, many agree the seaway is worth the money and manhours spent on it. The Duluth Port Authority reports each ton of general cargo leaves $12 to $18 in its port area, and 5 cents to $1 is left by bulk cargo.

U.S. Affiliates Abroad Build for American Market



British spark erosion machine is built under license from Firth Sterling Inc.



Grinder is produced by West Berlin subsidiary of Union Twist Drill Co.

A BRITISH firm is invading the U. S. market with four models of spark erosion machines that reportedly sell for one-third less than domestically produced units. Called Erodomatic, the servo-controlled machines are made by Wickman Ltd., Coventry, England, under license of Firth Sterling Inc., Pittsburgh.

The Erodomatics feature close tolerances, simple setup and operation.

Wickman believes that simplified operation, practical tolerances, and acceptable finishes are more important than speed. Two toolroom models operate at an erosion rate of 0.007 and 0.003 cu in. per minute on conventional steel. Production models can operate at 0.025 cu in. per minute.

Typical tolerances are 0.005 in. for diework although the machines can maintain tolerances down to 0.0002 in. Surfaces finishes up to 6 or 7 microinches can be obtained on tungsten carbide materials.

Delivered price, including import duties (Eastern ports), range from $5900 for the smallest bench model to $19,500 for the newest production model.

Burleigh & Stocker Machine Tool Co., Pleasant Ridge, Mich., is the U. S. distributor.

U. S. DEVELOPED tools and cutter grinders built to U. S. standards are being imported by Union Twist Drill Co., Athol, Mass., from its subsidiary in West Berlin, Germany, the Hartex Div. of R. Stock & Co.

The machines were originally designed by Union Twist Drill engineers for their own use. When the firm decided to market them, limited facilities in the U. S. prompted it to take advantage of its European subsidiary.

The Hartex line consists of five basic machines:

Model No. 1 is a cutter and reamer grinder.

Model No. 2 is a form cutter grinder to sharpen arbor type form relieved milling cutters.

Model Nos. 3 and 5 are tangent-arc profile grinders.

Model No. 4 is a Union multipoint drill grinder for crankshafts.

With the exception of No. 4, the machines are being built in West Germany. The feeds are arranged in decimal inch increments, and screws and bolts used in assembly have threads and heads that are standard in the U. S.

Sales and service will be through authorized machine tool distributors in the U. S. and Canada.

Health Service Looks at Auto Smog... Army Brainstorms R&D Priorities . . . Federal Housing Can Trigger Boom

Joseph F. Finnegan

Union Steps Up Emphasis on Job Security

THE tough bargaining policies of 1959 will carry over to 1960, says Joseph F. Finnegan, director of the Federal Mediation & Conciliation Service.

"Employers, who in past years had negotiated chiefly over 'how much?' are now putting emphasis on contract changes aimed at improving efficiency and reducing operating costs," says Mr. Finnegan. In contrast, attitudes of union leaders continue to reflect their growing concern for job security, "along with the usual primary drive for more extensive economic benefits."

He sees a "serious challenge" to the negotiating parties and his agency in 1960 because of the "hardening of positions on matters other than wage issues."

Flemming Asks for Smog Mufflers

Arthur S. Flemming, Health, Education & Welfare secretary, made a strong plea to the automobile industry to come up with an inexpensive smog fighter and make it standard equipment. (Detroit is already planning to do that in California.) Some observers interpret his plea as a threat. The U. S. Public Health Service is taking an increasingly closer look at the possible relationship of auto exhaust and cancer in heavily populated metropolitan areas.

One device reported to the House Commerce Committee would cost $10 factory installed.

Mr. Flemming's department now spends $5 million a year on air pollution research.

Army Looks at R&D Plans for Next Decade

Brainstorming is being used in a two week series of conferences underway in Washington. Its purpose: To establish a priority for Army research and development during the next decade.

Army officers and scientists and industry executives are considering these questions: 1. What weapons are needed to make small groups of infantrymen as strong as numerically superior enemy forces? 2. What vehicles can be developed to travel long distances yet avoid breakdowns and high fuel consumption? 3. How do you locate enemy targets quickly? 4. How do you move men overseas to put down small encounters before they develop into a general war?

New Reuther Investigation Threatened

Conservative members of the Senate are hot after UAW Prexy Walter Reuther again. They claim the Democrats have attempted to whitewash the UAW's action in the Kohler and Perfect Circle strikes and charge "violence and intimidation" are synonymous with Mr. Reuther's rise to power in the union movement.

Reynolds Pushes for Urban Renewal

Albert M. Cole, executive vice president, Reynolds Aluminum Service Corp., Richmond, Va., believes urban renewal programs can trigger a boom. He says $2.5 billion worth of federal money in such programs can result in $6.5 billion worth of housing, more than $1 billion of industrial construction, $1.5 billion in commercial construction, and almost $3 billion worth of public construction.

Mr. Cole believes: "Federal assistance in the redevelopment of our cities is here to stay. The business community must take its head out of the sand."

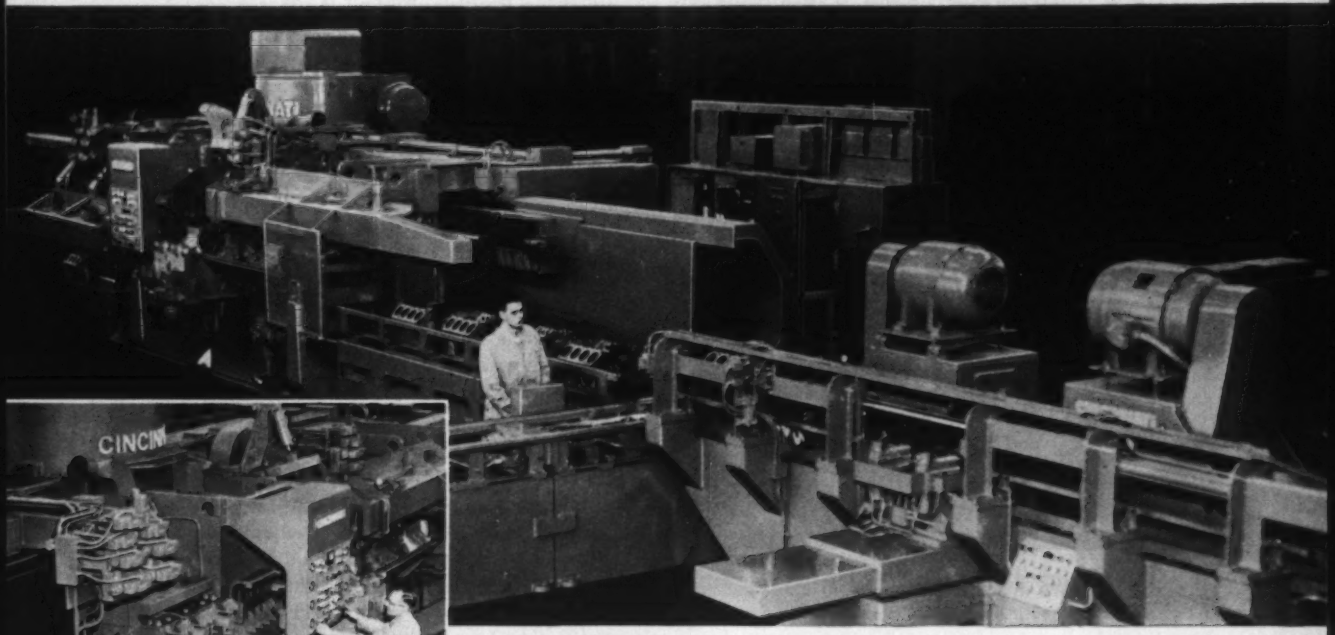
How Big Can We Grow?

James W. Knowles, special economic counsel for the Joint Economic Committee's employment, growth, and price levels study writes: Occasional minor recessions might occur, but the outlook is good. A high projection for the growth of economy of the U. S. to 1975: Gross national product will increase at a rate of 5.2 per cent from year to year. A low projection: 4.2 per cent per year.

Implication: Without changing our fundamental economic system in any way (no controls on wages or prices, for example), the U. S. can achieve an average annual increase in GNP of at least 4.6 per cent per year. At the same time, the rate of increase won't fall below 3.5 per cent yearly if we avoid a major depression. A prerequisite to such growth: Unemployment of not more than 4 per cent of the civilian labor force.

CINCINNATI | SPECIAL MACHINE DIVISION

incorporates Dependable Productivity in Cylinder Block Broaching and Milling Line



Broaching and milling of cylinder blocks are coordinated in this dependable productivity team of a CINCINNATI *Hydro-Broach and* CINCINNATI *Special Duplex Milling Machine. Inset shows broaching station.*

The amazing records of the automotive industry are a tribute to the *dependable productivity* of machines designed and built by Cincinnati. Cylinder blocks and heads, for example, in the big majority of today's automobiles are broached at the lowest possible cost on CINCINNATI Hydro-Broach Machines. And many additional CINCINNATIS are broaching exhaust manifolds, bearing caps, connecting rods, steering elements and other automotive parts. In the special broaching and milling line illustrated above, cylinder blocks are processed in a coordinated sequence of operations, at the rate of 100 blocks per hour.

A wide range of companies in many industries have improved their operating performance and the quality of their products through the assistance of Cincinnati's Special Machine Division. Our Engineering Service Specialists are ready to serve you. **Special Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**

SPECIAL MACHINES • COMPLETE PRODUCTION LINES
• VERTICAL AND HORIZONTAL BROACHING MACHINES

CINCINNATI®
SPECIAL MACHINE DIVISION

To the Executive
who watches his Competition closely . . .

Are you investigating Clad-Rex Vinyl-Metal Laminates?

Don't wait *too* long! Because Clad-Rex really reduces manufacturing costs *and* increases product sales appeal. And *that* kind of advantage would be better yours than your competitor's. Many other manufacturing executives are already using Clad-Rex vinyl-metal laminates for electronic equipment cabinets . . . automotive trim . . . appliances . . . furniture, etc.

Here are the facts:

Clad-Rex is a calendered, semi-rigid poly-vinyl chloride film laminated to sheet metal. All alloys and tempers of aluminum and steel (including galvanized and aluminized) are commonly used. Other metals can be used where their special properties are important to end product performance.

The most obvious advantage of Clad-Rex vinyl-metal laminates is styling. It's unlimited! Simulated woodgrains and leathers as well as a wide variety of colors and textures in sparkling burnishes (including high metallics), or non-reflective matte finishes. You can design your own if you prefer!

Not so obvious, *but most important of all*—Clad-Rex vinyl-metal laminates are practical. There is no complex technique or special tooling required to fabricate Clad-Rex. It can be fabricated in almost as many ways as any *un*-finished sheet metal. Furthermore, and without charge, a Field Fabricating Engineer is provided to show your production people how easy it is to get into production with Clad-Rex.

Actually, Clad-Rex *simplifies* your manufacturing operations. It's finished before you get it. Movement of sub-assemblies, etc., through your plant becomes more direct—out of your dies into assembly.

Clad-Rex lowers your end product cost. Although Clad-Rex costs more than *un*finished metal coming into your plant, elimination of expensive handling and finishing adds up to *less cost* when your product is ready to ship. Clad-Rex resistance to abrasion often eliminates the rejects common to *un*finished or other pre-finished metals. This includes the costly efforts to salvage those rejects, too.

Your product may need these other characteristics of Clad-Rex vinyl-metal laminates—high dielectric strength, and resistance to the corrosion of acids, alkalis, and household detergents.

So, see for yourself. Write for details. No obligation, of course. Perhaps you won't be first in your field to begin using Clad-Rex. But why risk competitive disadvantage by being last?

VINYL-METAL LAMINATES BY **CLAD-REX** DIVISION OF SIMONIZ COMPANY

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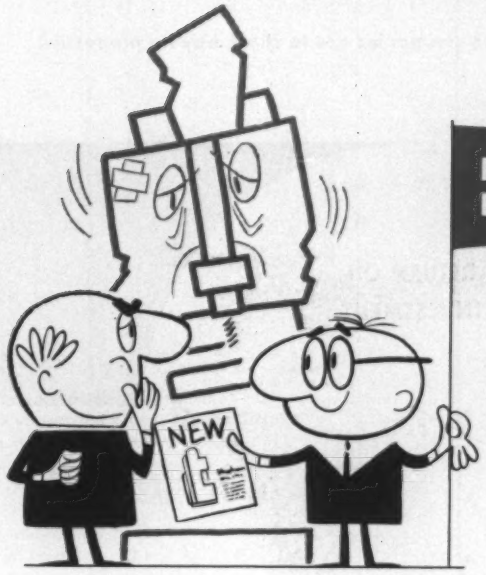


PRODUCTION EFFICIENCY

How to Sell It To the Boss . . .

YOU'RE a manager.

You have a good idea: Purchase a new machine to lower your unit costs through better production efficiency.

You also have a problem: Can you sell the boss? You've had trouble on that score in the past.

The odds will be more in your favor if you follow this procedure used by successful equipment salesmen:

1. Know the facts.
2. Ask for help from associates.
3. Make the pitch.
4. Reassure the boss.
5. Keep him sold.

Let's take them up one by one:

1. Know the Facts

An effective tool in selling anything is statistical proof that it will more than pay for itself.

The return-on-investment analysis developed by the National Machine Tool Builders' Association is used as a guide by the majority of 48 Cleveland companies surveyed for STEEL by Western Reserve University's School of Business. (The form on Page 59 will give you an idea of the data required.)

Most companies are familiar with the test developed by the Machinery & Allied Products Institute (MAPI), but not so many use it because they think it too complex and time consuming.

Those that favor the short payoff formula all require the investment to be returned within five years. The majority want a three year payoff.

Miscellaneous tests include the discounted cash flow system which is gaining in popularity. You project the rate of return on an investment. Timken Roller Bearing Co. believes it's an accurate, simple, and flexible method which does away with accounting jargon and deals only with cash flow.

Besides the statistical information, you'll need facts on intangibles. Will the new equipment improve quality, speed delivery, allow greater capacity for reserve, provide versatility, or enable processing shortcuts?

Where to get the tangible and intangible information? Venders can help. Don't be like the production superintendent of a New England company who refused to see equipment salesmen. He cut himself off from a valuable source of information.

2. Ask for Help

Another valuable source of information and support is the other experts in your own company. The industrial engineer for a steel fabricator knew what he was doing when he persuaded the sales department to do market research on whether it could use higher capacity. And the sales manager could also help in selling top management.

It pays to approach all the middle managers concerned because the boss may ask their opinions on your proposal. They'll feel "in the know" if you have already sought their support. They'll be more inclined to favor the proposition if you have presold.

3. Make the Pitch

You have your facts. You have support from other managers. The payoff is the interview with the

boss. Reams of advice have been written about how to handle this moment of truth. The fine points are usually for the professional salesmen, but remember this:

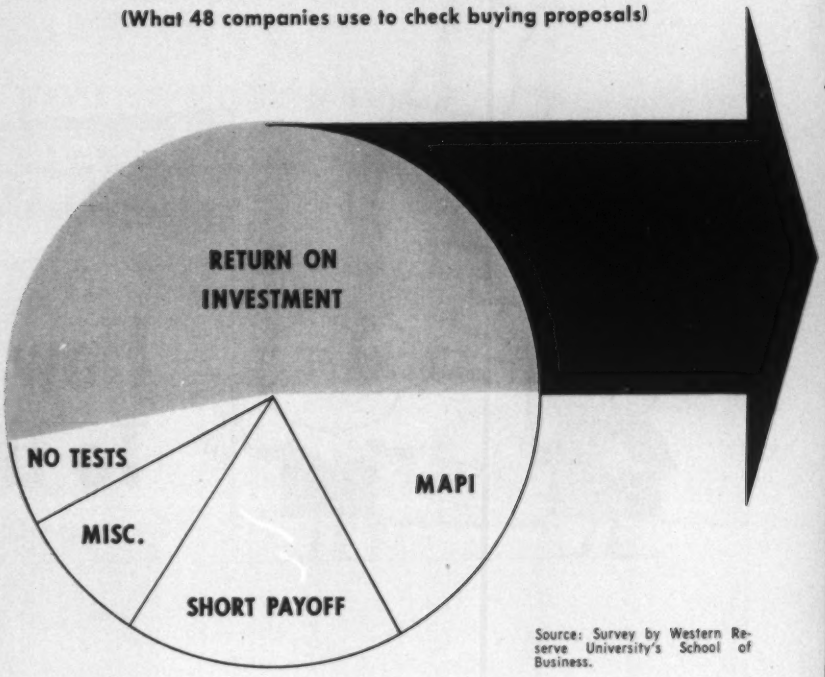
1. Rehearse your presentation.
2. Have charts, models, pictures, or other graphics your boss can see.
3. Emphasize the benefits of your proposal—at least twice.
4. Anticipate every conceivable objection.
5. Admit any drawbacks, but suggest how they can be offset.
6. Be as brief as possible.
7. Follow up to learn the ultimate decision.
8. Smile if you're turned down.

In preparing your pitch, use persuasive words like easy, you, safety, money, save, new, results, guarantee, proved, discovery.

Another suggestion: Uneasiness may be misinterpreted as lack of confidence in your proposition. Careful rehearsal can help give you a smooth delivery.

Tests Analyze Equipment Plans

(What 48 companies use to check buying proposals)



Source: Survey by Western Reserve University's School of Business.

4. Reassure the Boss

Good salesmen have to cope with buyers' emotions that block a sale. A score or more may stop the boss, but these stand out:

1. Fear of financial loss—"we can't afford it this year."
2. Fear of making a mistake—"we can't stand another debacle like that 1948 deal."
3. Fear of taking a chance—"this machine looks good, but I never heard of the builder."
4. Resistance to change—"the 1939 lathe is the best piece of equipment we've ever owned."
5. Fear of the union—"negotiations are coming up; we've got to watch our step."
6. Fear of the future—"we'd better wait before we buy; business doesn't look too good for the next year or so."

Such fears can be overcome many ways, but reassurance is the most common approach. Examples:

• A purchasing agent for a stamper persuaded the president to buy a fleet of lift trucks because competition had just mechanized its material handling.

• A plant superintendent made no progress in getting a new heat treating furnace until the boss saw similar units operating at two other plants.

• Prestige also does the trick. A chief engineer for a maker of components wanted a numerically controlled machine tool. He got the installation by showing the president that the company would be the first in its industry to own one.

• A Chicago president refused to authorize new overhead cranes. But he sold himself when he took some stockholders through the plant. The old cranes made so much noise he could hardly make himself heard. The next morning he O.K.'d the purchase, and part of the money came out of the public relations budget.

5. Keep Him Sold

Once the boss has approved a project, how do you keep him sold? Many companies are doing the job with a postaudit system.

The MAPI and other formulas require certain projections. But they never square exactly with experience. Estimated primary service life may be in error; production volume may increase or decrease; substantial improvements may be made in the same or competitive equipment.

Firms like Miehle Co. (a division of Miehle-Goss-Dexter Inc., Chicago maker of printing equipment) make a postaudit of replacements to determine how the projections compare with results. If the postaudits show a tendency to overestimate or underestimate the advantages from replacement, subsequent projections can be adjusted.

Miehle believes the postaudit should be made within a year after the new equipment is operating. Its industrial engineering department, working for the comptroller, gets the figures together: Cost of the unit, installation charges, salvage value, expense of ordinary maintenance and special repairs, tool costs, direct labor savings, setup charges, fringe labor costs.

T. V. Siverson, manager of industrial engineering at Barber-Colman Co., Rockford, Ill., says his company uses the postaudit for these reasons:

How to Figure Return on Investment

Cost of the New Machine is $ 22,673.00

	Old Machine	New Machine
Direct labor cost per hour	$ 2.85	$ 2.85
Fringe benefits per hour	$ .30	$ .30
Total hourly labor cost per hour	$ 3.15	$ 3.15
Divided by the number of parts produced per hour-units	(80)	(200)
Gives us total labor cost per piece	$ 0.0394	$ 0.0158
The new machine produces 1600 pieces per day		
At $ 0.0394 per piece on old machines they would cost		$ 63.04
At $ 0.0158 per piece on new machines they would cost		$ 25.28
Labor savings per day		$ 37.76
Annual savings, labor (40 hour week, 50 weeks per year)		$ 9440.00
Estimated additional savings per year		$ 180.00
Total Annual Savings		$ 9620.00
Desirable annual rate of recovery of capital invested in the new machine, assuming it has a ten year profitable life (1/10 of cost)		$ 2267.30
Amount recovered annually taxfree by 20 year depreciation schedule (½ of above)		$ 1133.65
Additional amount to be recovered annually out of profit		$ 1133.65
Earnings required annually before taxes (at 52%) to recover above amount (above figure divided by 0.48)		$ 2361.77
Annual capital recovery required over the ten year period: $ 1133.65 from depreciation plus $ 2361.77 from profit before taxes		$ 3495.42
Total annual savings		$ 9620.00
Required annually for recovery of capital		$ 3495.42
Annual net return on investment		$ 6124.58
Rate of annual return on capital invested; annual net return of $ 6124.58 divided by $ 22673.00 the cost of the new machine		27%

1. It helps verify production standards.

2. It helps verify tooling and supply costs.

3. It helps educate supervisors in the making of estimates and evaluations for future equipment decisions.

4. It tells management whether equipment decisions are being made wisely.

Teamwork and the Boss

The better the equipment buying function is organized, the less you have to sell in the conventional sense of the word. Take Miehle. Its team approach makes final approval easier.

On the team: The vice president - manufacturing, the works manager, the superintendent of manufacture, the chief industrial engineer, the manufacturing engineer, the two general foremen, and the nine foremen whose departments use nearly all the firm's production equipment. The group, except for the department foremen, meets twice a week to discuss new equipment, production processes, engineering changes, and other topics important to production efficiency. The group makes all the equipment purchase decisions.

It preplans investment: In August each year, every foreman submits to his general foreman a list of the new equipment he wants for the coming year, together with the reason for each proposal. The group discusses the recommendations at the semiweekly meetings and establishes a detailed equipment budget for the following year.

Example: In September, 1959, the group listed 24 machines and other equipment (value, $920,900) for purchase in 1960. Procedure: Each replacement is subjected to the MAPI formula to determine potential savings. The amount of potential savings, plus current considerations such as quality and delivery, determine purchase priorities.

Why Managers Have Trouble Selling the Boss

Listen to four typical situations:

- "I'm having a tough time justifying the need for a new grinder in the toolroom."—plant superintendent for an appliance maker.
- "I proposed automatic molding machines. We're buying manually operated squeeze machines because of the lower initial cost."—foundry manager.
- "If I want a new machine, I first try to get sales to say it can find the orders to utilize the higher capacity."—industrial engineer for a steel fabricator.
- "I got a $22,000 compressor by showing the boss that we needed a spare because the whole plant would shut down if one went haywire. While that was true, I really wanted a more efficient compressor."—plant engineer for a truck manufacturer.

The examples were turned up for STEEL by Dr. F. Robert Shoaf, motivation research consultant and assistant professor of marketing at New York University. He is interviewing metalworking managers to learn why and how equipment is or is not bought.

His findings confirm the belief that only a minority of companies are well organized to buy and use capital equipment. He also discloses a still more disheartening fact: Even when a firm has an established procedure for initiating, evaluating, and approving equipment purchases, the arrangement often bogs down. Three factors, all related to inadequate selling, usually account for the failure:

Cause No. 1—Middle managers are frequently poorly informed about financing possibilities to acquire machinery, or are in the dark about the company's ability to buy. The foundry manager who wanted the automatic molding machines may have been unaware of financial limitations which made the purchase of squeeze units the only compromise possible. The plant superintendent having trouble getting the grinder for his toolroom may have overlooked high interest rates. Perhaps the company president did

How to Build Your Sales Pitch

1. LAY THE GROUNDWORK

Set goals for improving your plant's productivity.

Search—constantly—for equipment ideas that will boost production efficiency.

Inform yourself about your firm's financial position.

2. GET EXPERT HELP

Sell your peers on your re-equipment proposals first.

Seek equipment venders' help for statistical support.

3. INVESTIGATE YOUR AUDIENCE

Find out what emotional factors will motivate your boss.

Discover what kinds of intangible factors will influence him.

Develop answers to any objections you anticipate.

4. PREPARE YOURSELF

Build graphics to help sell the idea.

Avoid overworked words, slang, and annoying mannerisms.

Don't bluff, exaggerate, use trickery, make misleading statements or unrealistic promises.

Rehearse your presentation.

Check and recheck the benefits of your proposal.

Tell your boss how much of his time you'll need to make the pitch.

5. MAKE A STRONG PITCH

Be enthusiastic.

Keep it brief.

not overlook that cost and ruled against the grinder.

The problem of financing and communicating about company finances is complex. The next article in the series on production efficiency will deal with it.

Cause No. 2—Many middle managers believe that the top bosses "don't know what they're doing" and that they are often skinflints. The remark of the purchasing director for an equipment builder typifies the attitude: "The big man upstairs must have the money in a sack before we buy." The resulting reaction of too many middle managers even when the shortcoming is imaginary: Extreme caution in making equipment buying proposals.

Top bosses checked by STEEL are unanimous in suggesting a solution: Better communications. C. A. Woodley, executive vice president for Caterpillar Tractor Co., says: "If selling top management is a problem, it shows poor communications. The bosses of any good company are eager for proposals. Their job is to make money, and they're always looking for anything that can make the plant more productive."

Cause No. 3—The Shoaf study shows that poor selling by the originators of equipment buying plans is the third common reason why the procedure may fail. Equipment proposals are originated nearly 85 per cent of the time by persons other than the president or similar top executive who must approve the expenditure, reveals the Western Reserve University survey.

The looser your company's organization for originating, evaluating, and approving equipment buying proposals, the greater the need for skill in selling ideas. Since only an estimated 25 per cent of metalworking has seriously tried to organize the function, your engineers, purchasing agents, and production managers must also become part-time salesmen in seeking to modernize your plant for greater productivity.

A STEEL check of the managers who buy one-third of metalworking's equipment indicates: Metalworkers would spend $20.7 billion this year on machinery if they had unlimited funds. While we'll actually spend far less than that in 1960 (but still a record $5.65 billion), we can get more for our money through:

- Better diagnosis of our equipment needs (STEEL, Feb. 8, p. 53).
- Better organization to improve the purchase and use of machinery (Feb. 22, p. 43).
- Better selling of equipment ideas to the boss.

And Now, Sell

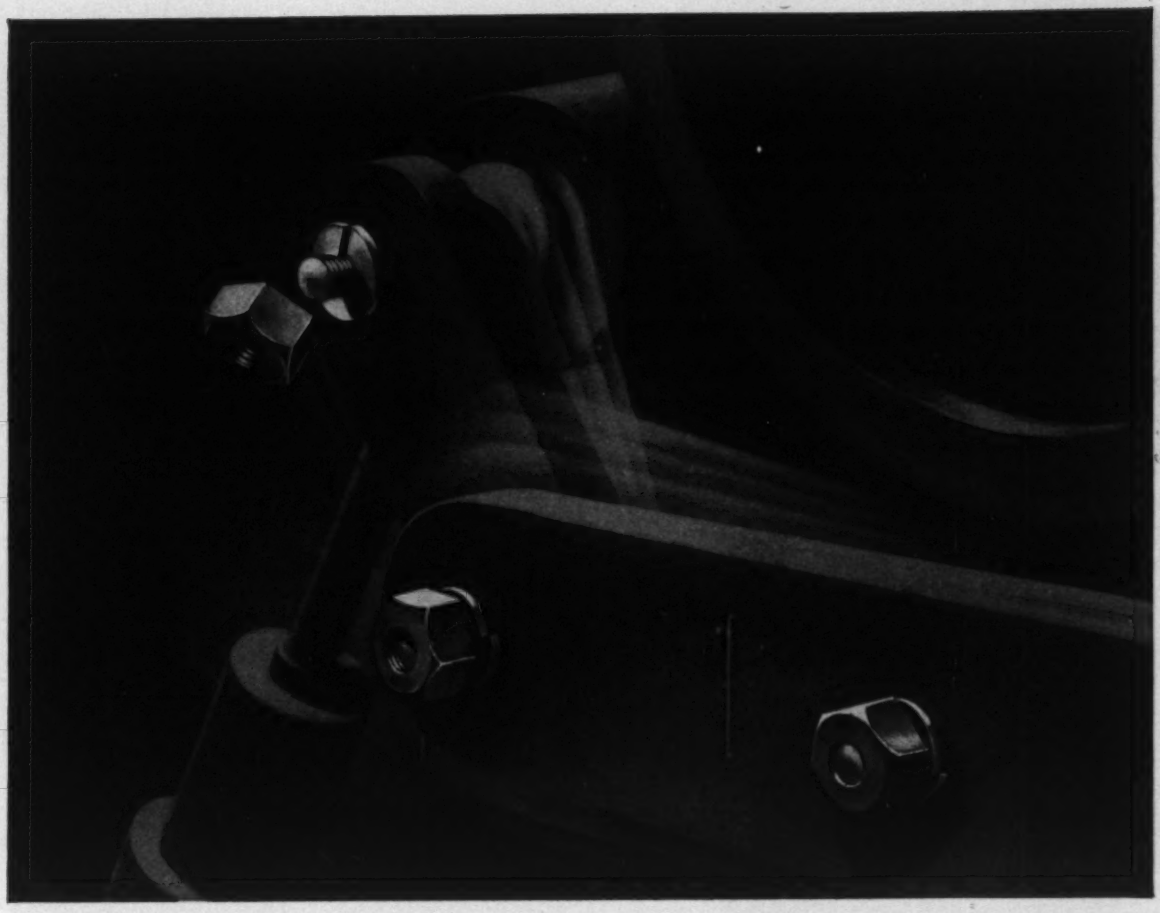
Any top official of a good company is eager for equipment proposals that will cut costs. That's part of his job. Any good president is also skeptical—on guard against unnecessary outlays. That's part of his job too.

The middle manager's task is to find reasonable arguments to put the skepticism to rest. That's how to sell production efficiency to the boss.

Production Efficiency

How to Find the Money for It

That's the subject of the sixth article in this series. It will be carried on these pages Mar. 21. This year's Program for Management began on Jan. 11 and is appearing every other week. For a free copy of all or any in the series, write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. Your use of material like this in STEEL may win you $1000. For details, see Pages 5 and 6.



30 SECONDS TO FAILURE!

—and somebody's reputation is shaking

When pounding vibration shakes loose common fasteners like these, critical working parts of a product usually fail. When this happens, the reputation of the manufacturer is shaken, too.

Elastic Stop® nuts will not shake loose. Each nut uses the exclusive red nylon locking insert to provide a continuing locking torque which absorbs impact and shock loads and holds under the most severe operating conditions. In the long run, it is exactly this capacity to lick vibration-induced failure that makes Elastic Stop nuts the most economical fasteners you can buy.

Elastic Stop nuts cost only a little more than the combination of fasteners used here. But can you afford the *real* price of any low-cost fastener that fails to provide reliability? For it's precisely this type of false economy that ruins reputations when customers incur costs for repairs, downtime and loss of production. As a matter of fact, the cost of extra field service may wipe out the manufacturer's profits, too.

Detailed photos are available showing exactly how Elastic Stop nuts solve critical fastening problems on rock drills, scrapers, snow plows, off-the-road truck and other heavy equipment. You can see these photos simply by writing to us. Or, we can send you test samples of the fastener sizes you need. Just write: *Dept. 842-360, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.*

Elastic Stop nuts offer 3 important design advantages:

Precision adjustment at any point on the bolt

Prevent leakage along bolt threads

Nylon locking insert is re-usable 50 times or more

ELASTIC STOP NUT CORPORATION OF AMERICA

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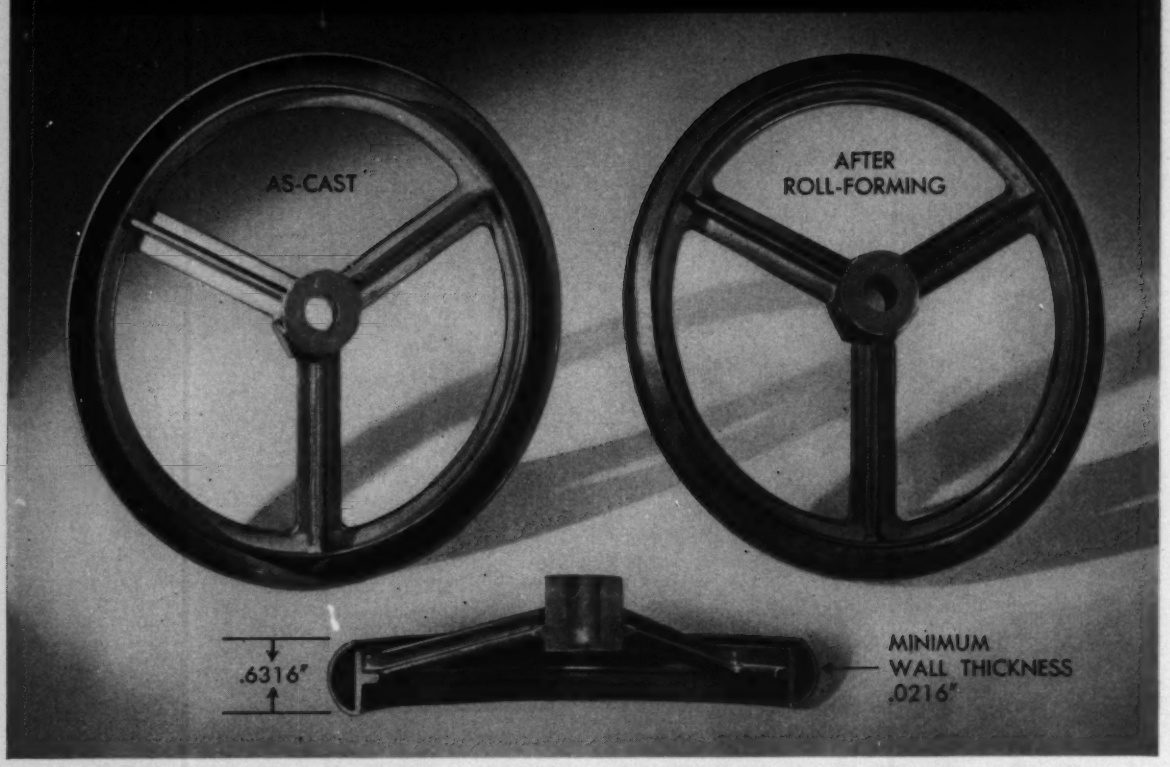

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Strength of this light-weight zinc die cast hand wheel is achieved by rigid, thin-wall sections. Cast in one piece with a U-section rim, the excellent ductility of ZAMAK allows forming at room temperature with one stroke of a high-speed press.

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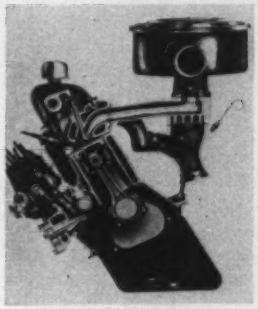
The Economy 'Six' Is Coming Back

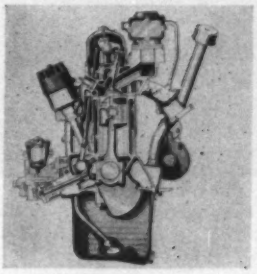
COMPACT CARS are cinching a revival of the six cylinder engine. The outlook: 2.3 million 1960 models (or 36 per cent of total auto output) will have the economy powerplants. It's the third straight year of production increases for sixes. They accounted for 28.1 per cent of 1959's production and 23.8 per cent of 1958's.

Almost all the gain this year will come from compact cars. Schedules for standard size Fords, Chevrolets, and Plymouths call for about the same number of sixes as last year. *Ward's Automotive Reports* says that so far the six is in an average of 25 per cent of the regular Plymouths and Fords. Chevrolet is scheduling almost 40 per cent sixes, Rambler 88 per cent, and Lark 55 per cent. Dodge has doubled its six cylinder output (now 22 per cent), but most of the engines are going into the Dart, which really ranks as a compact.

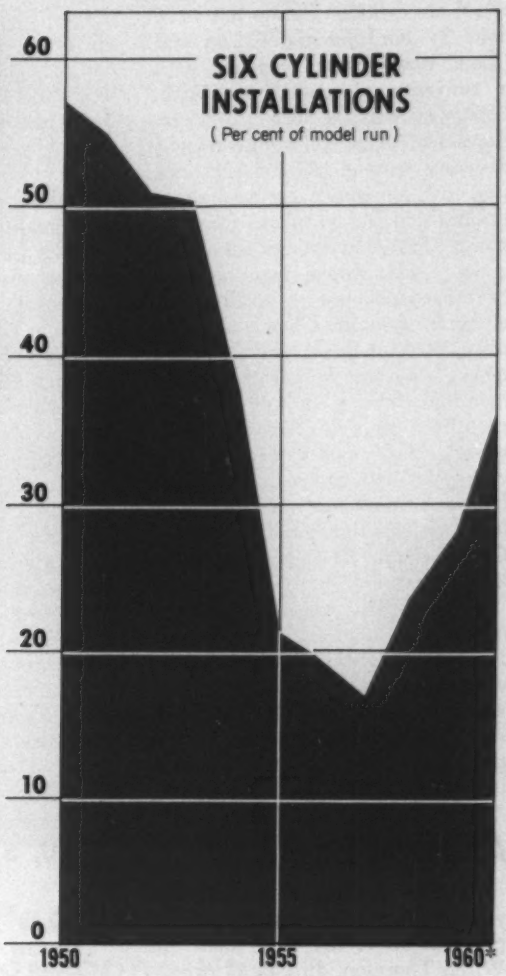
Corvair's Aluminum '6'



Chrysler's Slant '6'



AMC's In-Line '6'



Source: *Ward's Automotive Reports*
*Projected

• **What's Next?** — Although more compacts will appear in 1961, some will have economy designed V-8s. Pontiac reportedly will introduce a four cylinder powerplant in its smaller car—the first since 1955 when 100,000 were built for the vanishing Willys. With economy V-8s and fours on the market, it looks like the six won't regain the popularity it had in pre-World War II days. (At that time, it accounted for 65 per cent of yearly output.)

The last big year for the sixes was 1946. Only 34.5 per cent of that year's cars were eights (in-line or V-type). After that, buyers started to demand heavier cars and more power. In 1953, the split was 50:50. The sixes dropped to 40 per cent of output in 1954. The same year marked the end of the straight eight and the beginning of the horsepower race.

In record 1955, 1.7 million (21.4 per cent) sixes were built against 6.2 million V-8s. The horsepower race was called off in 1957, but it took another year before the six began to come back (see STEEL's chart above).

• **Many Changes**—Today's six is a far cry from its 1946 counterpart.

Valves in the heads, small bores and long strokes characterized the older engines. They pumped slowly and smoothly, but not spectacularly in terms of power output per cubic inch of displacement. They gave good mileage mainly because cars were lighter than they are today.

• **Longer Life** — Newer sixes are short stroked and most of them have overhead valves. Improved materials for pistons and valve trains permit faster combustion rates without slashing part life. Only ten years ago, the replacement of piston rings and valve grinding at 20,000 miles were expected. Almost any corner gas station could make the

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repairs. But how long has it been since you've had a ring job? When a connecting rod is thrown today, it makes luncheon conversation for a week.

Corvair and Valiant engines are excellent examples of designing engines from scratch. Perhaps the cleverest job on a basically conventional six cylinder engine has been done by Ford for the Falcon and Comet powerplants. Starting with a conventional gray iron block, Ford shortened the stroke to 2.5 in. Bores are 3.5 in. Weight-conscious designers have eliminated 122 parts from the company's standard six.

The side access plate (and its many fastening components) is gone. The intake manifold and cylinder head are integrally cast, eliminating another batch of studs, nuts, and gaskets and assuring quick heat transfer to the intake manifold through an uninterrupted path from the head. An aluminum, water heated spacer between the carburetor base and manifold makes for faster warmup and improved fuel vaporization and economy. Comet claims 28 miles per gallon in highway driving.

Result: The engine is 32 per cent lighter than a typical six. Its 144.3 cu in. displacement and 8.7:1 compression ratio produces an advertised 90 hp. Ford engineers privately claim dynamometer readings show horsepower at optimum revolutions per minute is closer to 110.

A Look at Exports

Rambler set export records last year—5180 units were shipped, 58 per cent above the 1958 total, but W. H. Thoreson, director of American Motor Corp.'s Export Dept., is disturbed.

"Not only are duty and taxes in European countries set at almost prohibitive levels, but shipping charges from East Coast ports to Europe are double those for the same car coming back to this country," declares Mr. Thoreson. He believes the barriers contributed to the decline in exports (from 252,000 in 1955 to 116,520 last year). Imports jumped from 30,000 in 1954 to 650,000 in 1959. "The about-face in the auto import-export picture adversely influenced the foreign trade balance in excess of a half billion dollars in 1959," he says.

Duty rates and taxes imposed on U. S. cars by European car producing countries range from 35 to 69 per cent. They're based on the landed cost price, which includes ocean freight, insurance, and engine displacement or car weight. By contrast, Mr. Thoreson points out that this country charges an import duty of 8.5 per cent of the price on all cars, excluding ocean freight, and a 10 per cent federal excise tax. The tariff rate used to be higher, but it was recently reduced 0.5 per cent a year to help bring about tariff reciprocity. Charges Mr. Thoreson: "This reciprocity hasn't been realized from an automotive point of view. It's time we stopped making automotive tariff reductions a one-way street!"

• **Help?**—Some relief may be forthcoming. Common Market countries eventually plan to charge an average import duty of 31 per cent on all nonmember car imports. Taxes will be set separately by each of the six nations in the Common Market. Duties among those countries are being reduced, and the plan is to eliminate them by 1970.

Another kicker: Ocean shipping charges, which are set by international conferences. Mr. Thoreson says it costs $328 to ship a Rambler from New York to Germany, but the same car can be shipped back to New York for only $158.

U. S. Auto Output

Passenger Only

	1960	1959
January	688,731	545,757
February		478,484
March		576,085
April		578,825
May		546,817
June		557,994
July		555,418
August		239,152
September		258,157
October		507,530
November		254,527
December		494,931
Total		5,593,677

Week Ended	1960	1959
Jan. 30	173,231	119,678
Feb. 6	164,027	114,282
Feb. 13	153,186	115,491
Feb. 20	158,898	120,780
Feb. 27	154,785†	127,783
Mar. 5	154,000*	133,540

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

More Buildups in Britain

Tariff restrictions or not, the world market for cars is growing. To meet increased demand, Ford Motor Co. of England plans to build a $70 million plant near Liverpool. It will be able to turn out 200,000 cars a year. Ford built 469,000 cars in Britain last year. Ford of Canada plans to construct a $3.5 million assembly plant in Rhodesia.

The English Ford program is part of a British government plan to build more auto plants in high unemployment areas. Capital expenditures of all British auto manufacturers are expected to be double 1959 outlays.

Exhaust Notes

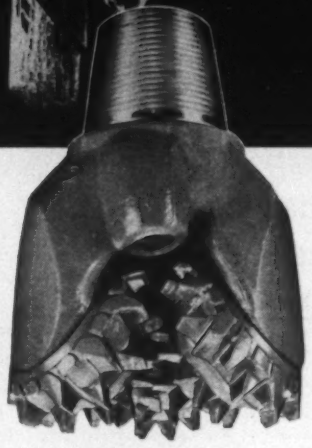
• French vehicle production hit a record 1.2 million units last year—1.08 million were passenger cars. Exports are estimated at 600,000 units. The previous production record (1958) was 1.12 million vehicles.

• Chrysler Corp. predicts that sales of its air conditioning unit will more than double by 1963. E. M. Braden, Chrysler-Imperial Div.'s sales manager, figures the installation rate should be better than 35 per cent in three years. The current rate for the Imperial is 43.6 per cent. In 1957, 29.9 per cent of the luxury cars were air conditioned.

• Another report from Chrysler: So far in the model run, 78 per cent of its cars have automatic transmissions, 55 per cent have power steering, and 58 per cent have radios. Heaters are going into all but 4 per cent, and 67 per cent have whitewall tires. Some of the percentages may be upset as Chrysler goes after fleet sales—such cars tend to be standards. The company has formed a dual fleet sales organization. One group will push Plymouth, De Soto, Valiant (and Chrysler and Imperial) cars. The other group will sell Dodge cars and trucks.

• Guessing the names of new cars is one of the most speculative games Detroit plays. Here are the "best bets" for the new compacts being readied for 1961: Buick Invader, Pontiac Panther, Oldsmobile Rocket, and Chrysler Lancer.

Photograph courtesy of Pacific Forge, Inc., Fontana, Calif.



Of course Pacific Forge is fussy about surface condition

On drill bits for Security Engineering Division, Dresser Operations, Inc., Aristoloy round-cornered squares meet this forger's stringent requirements. In-plant scarfing and grinding prior to forging have been eliminated—rejects caused by surface defects have been reduced to a minimum.

The secret—careful control of Aristoloy Steels from electric furnace melting to final rolling operations. The result—alloy steels of prime forging quality—and uniform chemical, structural, and hardenability characteristics that satisfy the critical use requirements for rock drill bits.

For complete information about Aristoloy structural alloy, stainless and carbon steels in leaded or standard analyses, contact the local Copperweld representative in your nearest large city. Or write for complete information.

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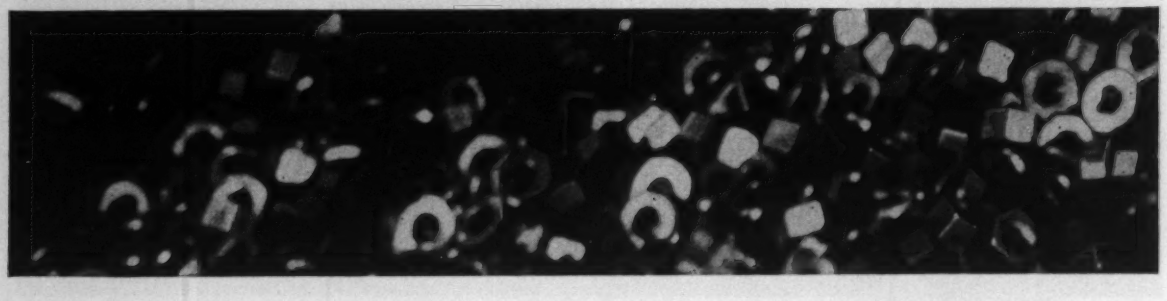
Change in nut saves $11,000

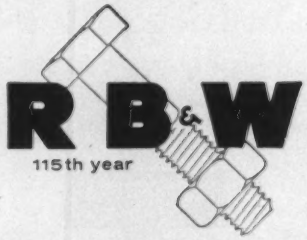


RB&W survey shows business machine maker how simple change in fastener dimensions will add to profits the equivalent of $110,000 in extra sales

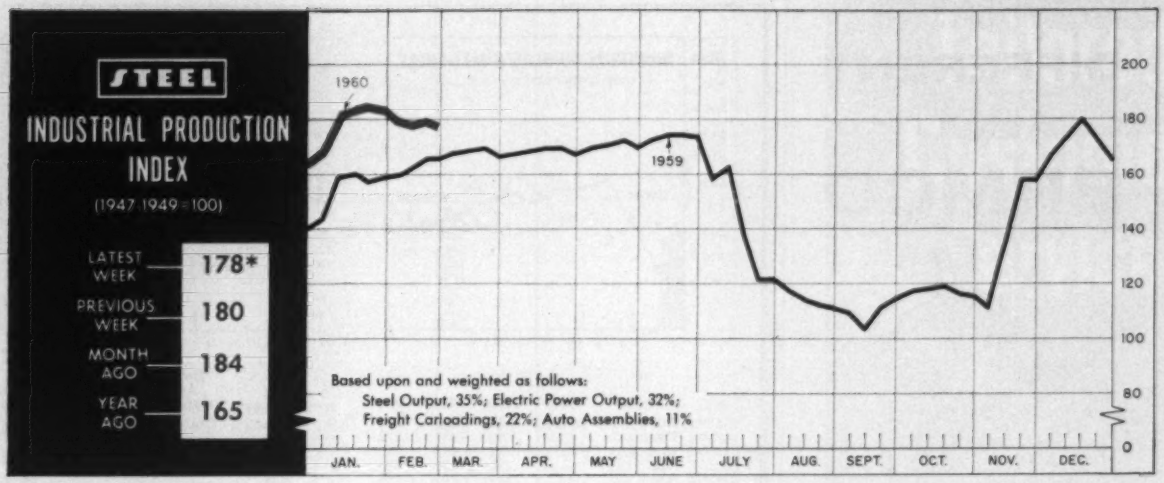
A simple change in nut size offered one typewriter manufacturer an $11,000 a year saving. Yet it involved no re-engineering . . . no compromise with quality.

The RB&W Fastener Man was invited to make a survey of the manufacturer's fastener usage. In studies of blueprints and specifications, he found only one minor area for improvement—but what an improvement! The drawings still showed a hex nut taken from specifications long obsolete as a standard. By simply switching to the current standard size, the manufacturer could save $11,000. That's pure profit. Even if his net-on-sales were as high as 10 per cent. It would take *extra* typewriter sales of $110,000 to net the same amount.

Are you sure you're not wasting needless dollars on fastener specifications? Why not ask for an RB&W man to make a survey of your fastening operations. He's no smarter than your engineers, but he knows what to look for. Write Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.



Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.



*Week ended Feb. 27.

First Quarter Decline Is Normal

EVIDENCE is piling up that the peak has been reached in the post-strike upturn—at least for the time being. But businessmen are doggedly sticking to their predictions that this will be a better year overall than 1959. They are adopting a wait-and-see attitude until springtime before making other than minor adjustments in their plans.

"January mood" is the way the National Industrial Conference Board describes the feeling of uncertainty during the early days of 1960. There is normally a letdown after the Christmas holidays. The drop was sharper than usual this time because steelmakers and auto producers pushed to replenish stocks at yearend.

• **Index High** — Typical of the trend of business in general is STEEL's industrial production index (above). Late in 1959, it looked like the trend line would continue mildly upward during the first half because of two forces: 1. The end of the steel strike would unleash a flood of spending which had been deferred during the artificial recession. 2. Inventory rebuilding would extend well into the second quarter.

Neither factor has been as strong as most business analysts figured.

Because of those developments, STEEL's index for the first quarter is following the downward trend typical of five of the last seven years. (Only the recovery years of 1955 and 1959 ran counter to the pattern.) After hitting an all-time high of 185 (1947-49=100) in the week ended Jan. 23, the index has declined almost steadily to 178 (preliminary) for the week ended Feb. 27. However, the level is still higher than any peak prior to the steel strike. If the predominant pattern of the post-Korean period holds, the index will continue to slip a point or two a week until the normal spring pickup.

• **Inventories in Line**—The rela-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,654[1]	2,690	2,556
Electric Power Distributed (million kw-hr)	13,900[1]	14,226	12,972
Bituminous Coal Output (1000 tons)	7,200[1]	8,355	8,055
Crude Oil Production (daily avg—1000 bbl)	7,150[1]	7,123	7,199
Construction Volume (*ENR*—millions)	$307.8	$342.2	$285.8
Auto, Truck Output, U. S., Canada (*Ward's*)	195,521[1]	200,081	162,728
TRADE			
Freight Carloadings (1000 Cars)	585[1]	572	576
Intercity Truck Tonnage (changes from year ago)	+2.9%	+3.1%	+22.0%
Business Failures (Dun & Bradstreet)	289	317	310
Currency in Circulation (millions)[3]	$31,562	$31,631	$31,111
Dept. Store Sales (changes from year ago)[3]	−2%	+4%	+24%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,266	$25,402	$21,245
Federal Gross Debt (billions)	$290.4	$290.5	$285.5
Bond Volume, NYSE (millions)	$23.3	$30.7	$27.1
Stocks Sales, NYSE (thousands of shares)	12,690	17,290	16,355
Loans and Investments (billions)[4]	$102.9	$102.9	$94.1
U. S. Govt. Obligations Held (billions)[4]	$25.7	$26.1	$33.8
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	247.82
STEEL's Nonferrous Metal Price Index[6]	234 2	234.8	216.0
All Commodities[7]	119.2[1]	119.2	119.1
Commodities Other than Farm & Foods[7]	128.6[1]	128.6	127.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1960, 2,844,306; 1959, 2,831,846. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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If you buy aluminum, brass or bronze in strip and rolls, you may think all suppliers are alike. They're not. No one supplier can be all things to all people, and few try. If you are the type of buyer who looks for something a little "extra" in quality, workability and service, you might make it a point to learn more about BRMCO. With BRMCO metals, uniformity of width, gauge and grain size results in greater efficiency and lower metal working costs. For example, BRMCO can hold temper tolerances to within plus or minus 3 points on the Rockwell scale.

Apart from just plain better quality metals, you can count on these "plus" services: *specific date delivery, even special packaging or shipping arrangements to suit your individual requirements.*

The man from BRMCO can tell you the rest of the story, including information on our own special alloys for unusual requirements.

We'll be happy to send you samples for your own testing and analysis. Simply write, or call collect.

BRMCO

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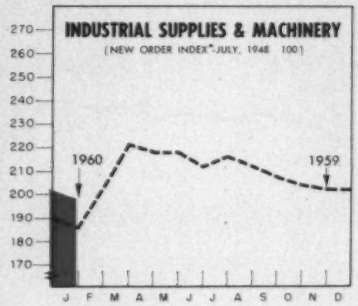
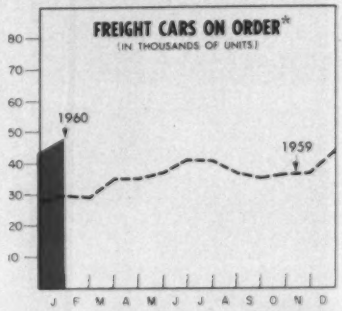
BRIDGEPORT, CONNECTICUT
Subsidiary of Atlantic Coast Industries, Inc.
FINE QUALITY ALUMINUM, BRASS AND BRONZE IN STRIP AND ROLLS

THE BUSINESS TREND





	1960	1959	1958	1957
Jan.	198	186	163	221
Feb.	...	202	157	219
Mar.	...	221	149	210
Apr.	...	218	148	203
May	...	218	152	199
June	...	212	164	199
July	...	216	170	197
Aug.	...	212	172	197
Sept.	...	207	178	203
Oct.	...	204	187	192
Nov.	...	202	189	180
Dec.	...	202	190	167

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.
Charts copyright, 1960, STEEL.

	Domestic Awards		Backlogs (end of month)	
	1960	1959	1960	1959
Jan.	7,149	4,102	48,170	29,470
Feb.	....	1,842	.....	28,789
Mar.	....	10,782	.....	35,487
Apr.	....	3,735	.....	35,479
May	....	5,203	.....	36,869
June	....	8,389	.....	40,973
July	....	4,159	.....	40,309
Aug.	....	1,653	.....	37,172
Sept.	....	943	.....	35,626
Oct.	....	2,722	.....	36,199
Nov.	....	2,424	.....	36,555
Dec.	....	10,560	.....	43,870
Totals	....	56,494		

*Domestic only.
American Railway Car Institute.

tively low level of inventories leads many economists to believe there is plenty of life left in the current business cycle. The ratio of total business inventories to shipments is about 1.5 (stocks are equal to about 1.5 month's business at the current shipment rate). For years, economists have held that there is no danger until the ratio approached 1.6 months. But the theory is undergoing close scrutiny.

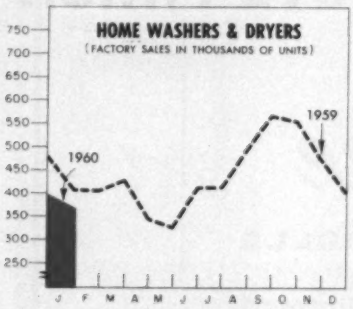
Some economists feel the critical figure should be revised downward. They cite at least four reasons why it may not be necessary or desirable to build stocks to a "normal" level: 1. Inventory control techniques are more widely understood and used than ever. 2. Capacity is sufficient in most lines (with the possible major exception of paper board) to meet foreseeable requirements. 3. High interest rates and tight money make it more profitable to use inventory money for other purposes. 4. Long term labor contracts eliminate the annual threat of shortages due to strikes.

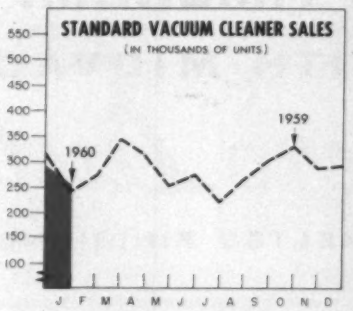
January Reports Disappointing

But the business reports for January are falling below expectations for many industries. (Perhaps because the expectations were colored by overoptimism following the steel strike.)

January orders for machine tools, at $57 million for both cutting and forming types, were termed "disappointing" by several members of the industry. They were slightly beneath the December total and only slightly above the 1959 monthly average. And murmurs from the industry indicate that February will be off another notch or two. Yet Dr. James Hodge, executive vice president of Warner & Swasey Co., Cleveland, is confident that 1960 will be somewhat better than 1959, which was in turn better than 1958. Shipments dropped significantly from December's $63.85 million to $46.45 million, reports the National Machine Tool Builders' Association. But Dr. Hodge points out that the December figure, not January's, should be considered out of line. "Many builders push to get as much out before the end of the year as they can, which resulted in a distorted picture in December."

The American Supply & Machinery Manufacturers' Association's report for January shows another 4 point dip to 198 (July, 1948 =100), continuing a steady downtrend started last April. (See table





	Washers		Dryers	
	1960	1959	1960	1959
Jan.	254,565	288,491	111,603	118,220
Feb.	.....	297,826	.....	106,274
Mar.	.....	329,668	.....	98,434
Apr.	.....	274,372	.....	67,752
May	.....	277,934	.....	45,903
June	.....	341,894	.....	70,838
July	.....	318,063	.....	95,248
Aug.	.....	359,849	.....	133,197
Sept.	.....	394,112	.....	174,560
Oct.	.....	374,135	.....	179,669
Nov.	.....	312,796	.....	157,047
Dec.	.....	264,236	.....	134,633
Totals	.....	3,833,376	.....	1,381,775

American Home Laundry Mfrs. Assn.

	1960	1959	1958
Jan.	258,330	242,516	265,489
Feb.	.....	271,396	225,631
Mar.	.....	346,557	291,418
Apr.	.....	317,402	247,293
May	.....	257,345	218,766
June	.....	275,974	253,127
July	.....	221,232	263,778
Aug.	.....	268,465	280,226
Sept.	.....	305,096	299,618
Oct.	.....	330,899	339,127
Nov.	.....	290,130	293,609
Dec.	.....	293,818	316,965
Totals ...	.....	3,420,830	3,295,047

Vacuum Cleaners Mfrs.' Assn.

and graph on Page 68.)

But gearmakers increased their volume of new orders by 4.1 per cent. The index of the American Gear Manufacturers Association reached 243.4 (1947-49=100) in January, the best level since last September. And manufacturers of resistance welders booked $3,257,-853 worth of new business, the highest total in almost three years, says the Resistance Welder Manufacturers' Association. However, their shipments dropped to $1,582,-000 from December's $2,353,000.

Appliance makers, for the most part, are in a seasonal downtrend aggravated by oversupply in the pipelines. Shipments of all types of gas ranges totaled 132,100 units, well below both the month-ago and year-ago figures, states the Gas Appliance Manufacturers Association. But GAMA reports that shipments of gas water heaters rallied in January, topping the preceding month's figure by 20,500 units. However, the total of 215,900 was still 18.9 per cent under January, 1959.

Factory sales of home laundry appliances dropped 8 per cent under the December total and 10 per cent under the corresponding 1959 level, says the American Home Laundry Manufacturers' Association. (See table and graph above for washer and dryer statistics.)

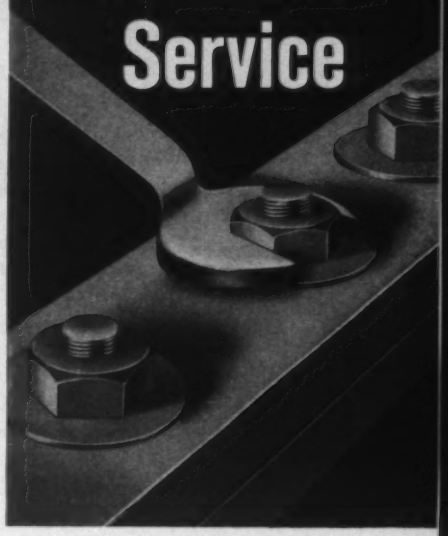
Although sales of standard size domestic vacuum cleaners dropped below the December mark (see graph and table above), the 258,-330 units in January stood 6.5 per cent above the year-ago level.

Trends Fore and Aft

- For the first seven weeks of 1960, business failures averaged 292 firms a week, Dun & Bradstreet Inc. reports. That is well below the corresponding average of 301 in 1959 and 317 in 1958.
- During the first eight weeks of this year, contract awards for future construction were running neck and neck with those of the similar period of last year, states *Engineering News-Record*. Comparison: $2.667 billion for 1960 vs. $2.677 billion for 1959.
- "Despite reported tightness of short term commercial bank credit, ample mortgage funds will continue to be available for soundly planned, large scale residential and nonresidential projects at interest rates close to 6 per cent," predicts Robert Neaderland, president of Pease & Elliman Inc., New York.

News for
HEAVY INDUSTRY...

Tailored Customer Service



Whether you're building heavy machinery, steel mills, railroad cars, construction equipment or other capital equipment . . . we can save you time, money and production problems with *tailored customer service:*

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VMA 6993

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Made from consumable electrode vacuum melted Midvac Steels these rolls offer qualities unsurpassed in cleanliness and ductility by any metal finishing rolls. They have a super uniformity of fine grain structure, maximum freedom from defects and non-metallic inclusions.

Midvac Rolls are precision ground to a deep, black, Micro-Lustre finish... assure rolling of stainless steel, foil and precious metals free of surface imperfections. The super uniformity throughout has resulted in rolls lasting twice as long between grinds. The deep Micro-Lustre grain structure makes it possible to cut grinding time in half.

Improve product quality and get more footage out of every roll — specify Midvac Rolls on your mills. Midvale-Heppenstall also makes forged rolls for rolling steel and non-ferrous metals, paper, plastics and rubber.

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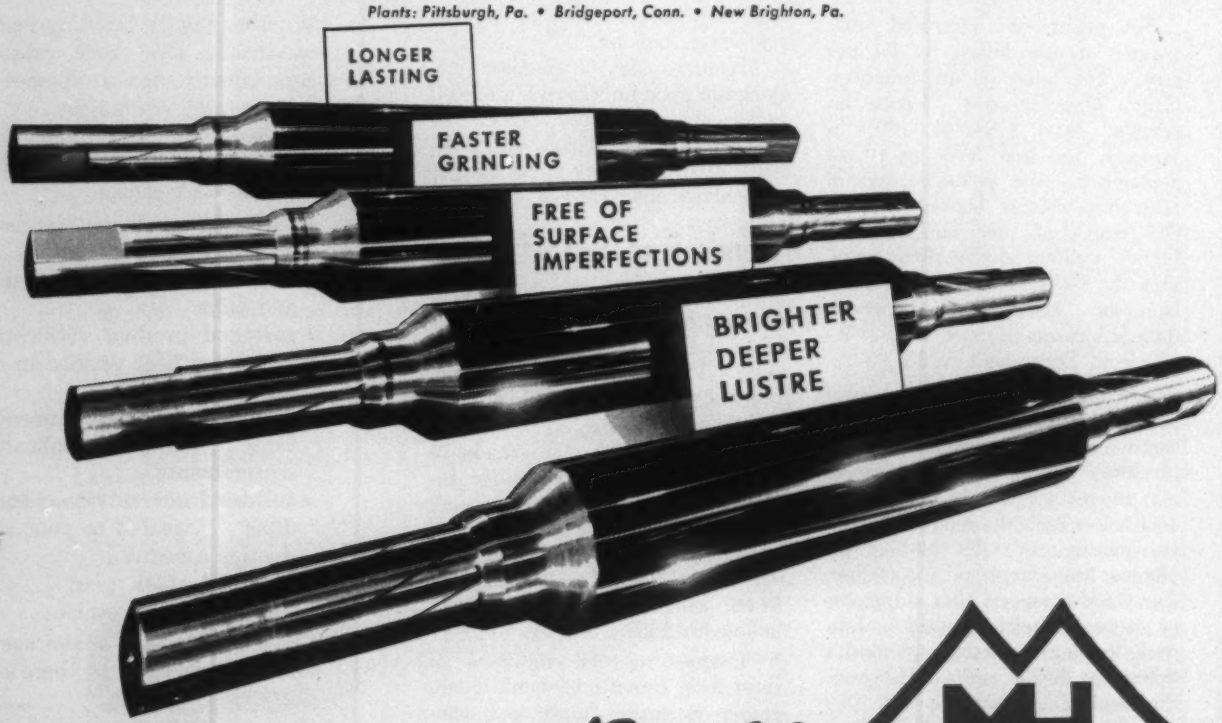


Midvac Rolls

MH

ROBERT A. NIEMINEN
Hickok v. p.-mfg.

HAROLD F. AMES
Controls Co. of America v. p.

JAMES S. LOCKE
heads Brown Instruments Div.

DR. M. P. L. SIEBEL
Pall Corp. div. post

Robert A. Nieminen was elected vice president - manufacturing, **Hickok Electrical Instrument Co.**, Cleveland. He was director of manufacturing for Kellogg Switchboard & Supply Co.

Harold F. Ames was elected a vice president of **Controls Co. of America**, Schiller Park, Ill. He also was named director of sales of the new Control Switch Div., a combination of the former subsidiary, Hetherington Inc., and the former Electrosnap Corp. Mr. Ames was president and general manager of Electrosnap Corp. before it was merged in December, 1959.

William N. Brammer was made vice president-marketing, **Precision Casting Co.**, Cleveland, a division of Precasco Corp.

Richard G. Ochsner fills the new post of director of materials for **Yale Materials Handling Div.**, Yale & Towne Mfg. Co., Philadelphia. He is in charge of creation and implementation of material control and purchasing policies. To assist him are: **Leo Postrel** as materials administrator; **Charles W. Curtin**, purchasing agent in charge of the Purchasing Dept., Philadelphia plant; **Charles W. Fielding** as manager, Material Control Dept., Philadelphia plant.

Kenneth S. Bayless was made vice president-sales, **Cal - Metal Pipe Corp.**, Baton Rouge, La.

Gavin Embry was made industrial engineering manager, **Pacific Coast Engineering Co.**, Alameda, Calif.

James S. Locke, newly elected corporate vice president of Minneapolis-Honeywell Regulator Co., was made vice president-general manager of its **Brown Instruments Div.** Former vice president-general manager of Honeywell's Micro Switch Div., he also will be responsible for operations of the Valve Div. in Ft. Washington, Pa., and the Fall River, Mass., Div. Vice President **Henry F. Dever**, head of the Industrial Products Group, transfers from Philadelphia to company headquarters in Minneapolis. Mr. Locke succeeds **C. L. Peterson** who becomes vice president of the company's central region with headquarters in Cleveland.

Richard D. Crowley was made director of purchases, **Columbia-Geneva Steel Div.**, Los Angeles, U. S. Steel Corp. He was assistant director-purchases for U. S. Steel in Pittsburgh.

Edwin S. Coyle was promoted to manufacturing manager, Electronic Controls Section, **Budd Co.**, Philadelphia.

Edwin M. Tatman was made San Francisco district sales manager for **Aluminum Co. of America.** He succeeds **Robert A. Rohn**, transferred to headquarters in Pittsburgh as assistant product manager in charge of wire, rods and bars, and structural shapes.

Dr. Walter R. Hibbard Jr. was appointed manager, Metallurgy & Ceramics Research Dept., General Electric Research Laboratory, **General Electric Co.**, Schenectady, N. Y.

Dr. M. P. L. Siebel, former research associate (metal forming and cutting) at Columbia University, joined **Pall Corp.**, Glen Cove, N. Y. He has been made general manager of its newly formed Pressure Equipment Div.

Howard L. Roat was made works manager, **AC Spark Plug Div.**, Milwaukee, General Motors Corp. Former manufacturing manager for the division in Flint, Mich., he succeeds **Roy E. McCullough**, made director of advanced manufacturing development for the division in Milwaukee. **Dale Bachtel** succeeds Mr. Roat in Flint.

Frank S. Wilkins succeeds the late **N. A. Hansen** as superintendent of the Rod & Wire Dept., Aliquippa, Pa., Works, **Jones & Laughlin Steel Corp.** **Robert K. Mark** succeeds Mr. Wilkins as assistant superintendent. **Frederick D. Delve** was made supervisor, Steel Works Div., Metallurgical Dept., Pittsburgh Works.

Henry C. Willms was promoted to manager of the Jones Mills, Ark., reduction plant of **Reynolds Metals Co.** He succeeds **Alex Leipper**, resigned to accept a post as vice president of operations at Canadian British Aluminium Co. Ltd., Baie-Comeau, Que., Reynolds affiliate.

Max D. Liston was made director of **Beckman Instruments Inc.'s** new Special Products Div., Fullerton, Calif. He was Beckman's director of engineering.

William A. Johnson was elected president, **Elwood Hemlin** vice pres-

C. E. THAYER
Ohio Forge president

WALTER SCHMID
new post at Stewart-Warner

ROBERT R. WAGSTAFF
United Engineers v. p.

P. C. HINTZ
Standard Tube v.p.-sales

ident of **R-O Mfg. Co.**, Madison Heights, Mich.

C. E. Thayer, executive vice president, was elected president, **Ohio Forge & Machine Corp.**, Cleveland. He succeeds the late **H. B. Newell**, former president and chairman.

Stephen Frye was elected president, **Sivyer Steel Casting Co.**, Milwaukee, to succeed **Martin A. Fladoes**, now chairman. **Charles C. Means** was made vice president-sales for the Milwaukee and Chicago plants. **Arthur C. Tishacek**, vice president and works manager, has retired.

John W. Miller was named technical director of **Tungsten Alloy Mfg. Co.**, Newark, N. J. He was with Firth Sterling Inc.

Volco Brass & Copper Co., Kenilworth, N. J., named **Joseph C. McCormack** executive vice president, **William V. Mernick** vice president-sales, **Walter C. Drayton** general sales manager. Mr. Drayton was also made vice president of the subsidiary, New Jersey Rolling Mills.

Elvin H. Whary was made western regional sales manager, **Datex Corp.**, Monrovia, Calif., subsidiary of Giannini Controls Corp.

D. J. Arnold was named regional manager of the newly created North Central region of **Denison Engineering Div.**, American Brake Shoe Co., covering Ohio and parts of Michigan, Pennsylvania, West Virginia, and Kentucky.

Neal A. Pritchard was made market research manager for the Automotive Divisions of **Thompson Ramo Wooldridge Inc.**, Cleveland.

Alemite & Instrument Div., Stewart-Warner Corp., Chicago, appointed **Walter Schmid** manager of manufacturing-engineering, **John Simkus** superintendent of all division assembly operations and departments.

Robert R. Wagstaff was elected engineering vice president of **United Engineers & Constructors Inc.**, Philadelphia. He was chief engineer.

Bennet F. Becker was made Eastern sales manager, **Camloc Fastener Corp.**, Paramus, N. J.

P. C. Hintz was appointed vice president-sales, **Standard Tube Co.**, Detroit. He represented the company in the Buffalo area for the last seven years.

Clarence F. Van Epps was named director of purchase analysis at **Stromberg-Carlson Div.**, Rochester, N. Y., General Dynamics Corp. He was manufacturing director, Electronics Div.

Donald F. Oltz was made assistant

FRED W. ELLIOTT

JAMES A. DRAIN

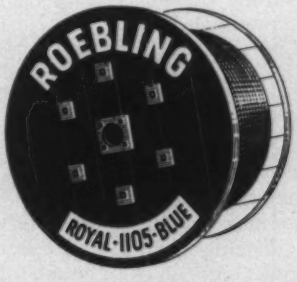
EMMETT H. MANN

B. CAMPBELL BLAKE

H. K. Porter Company Inc., Pittsburgh, appointed four group vice presidents: **Fred W. Elliott** is responsible for divisions manufacturing friction and rubber products, refractories, and paint, as well as Mexican operations; **James A. Drain** for electrical divisions and Canadian operations; **Emmett H. Mann** for fabricated metal products divisions. **B. Campbell Blake** continues to operate Connors Steel Div. as vice president and general manager; as group vice president, he will oversee operations of Vulcan-Kidd Steel Div.

Porter group vice presidents

When you're talking about a $162,000 dipper shovel, you've got to talk about the best rope for it



Talking about or working with, the same thing applies. Anything below Royal Blue's performance level is simply unrealistic. Like looking for a cut-price brain surgeon.

Even at $162,000, the cost of wire rope is important. That's why so-so ropes can cost you more in the long run, because so-so ropes are *short run*. Royal Blue, on the other hand, is built by America's oldest manufacturer of wire rope to last, to do the job without a whimper. Here's why.

Royal Blue is made from the toughest rope wire ever made—Type 1105—extra high-strength improved plow steel. This pedigree gives to the rope qualities that you can't find in any other rope: exceptional resistance to shock, abrasion, fatigue and impact. Add to these a flexibility that age cannot wither nor hustling fade and you've got a collection of characteristics that make Royal Blue the strongest rope you've ever used.

A $162,000 Dipper Shovel deserves the best and your Roebling Distributor has it . . . Royal Blue. For information, write to Roebling's Wire Rope Division, Trenton 2, N. J.

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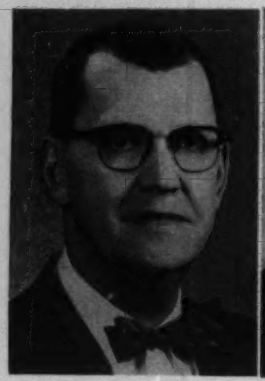
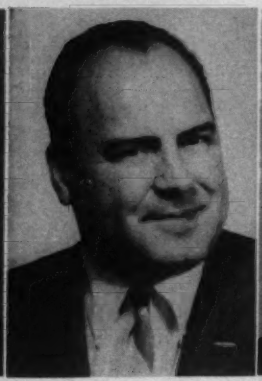
B. H. DENZ
Youngstown Steel Tank eng.

HENRY J. CHRIST JR.
Gabriel Div. operations v. p.

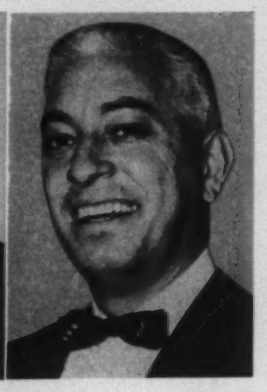
RAYMOND C. KOBUS
Dodge production mgr.



EMIL ROMANS
Canton Malleable foundry mgr.



ALBERT T. HAPKE
Brooks & Perkins marketing dir.



JACK L. MARTIN
Superior Foundry mfg.-eng.

sales manager, **Lufkin Rule Co.**, Saginaw, Mich.

Emil Romans was named foundry manager, **Canton Malleable Iron Co.**, Canton, Ohio, subsidiary of Penn Machine Co. He formerly served for 26 years with National Malleable & Steel Castings Co. in Cleveland.

Albert T. Hapke was named to the new post of director of marketing of **Brooks & Perkins Inc.**, Detroit. He will be temporarily headquartered in California where he has recently been engaged as a technical consultant on West Coast marketing.

Peter Zack was named assistant vice president - manufacturing, Atlantic Div., **National Can Corp.** He has headquarters in division offices in Baltimore.

George A. Nemec was made assistant superintendent of the blooming mills and billet mill at the Cleveland steel plant of **Republic Steel Corp.**

Jack L. Martin was appointed manufacturing engineering manager of **Superior Foundry Inc.**, and its **Allyne-Ryan Div.**, Cleveland. He was with James B. Clow & Son Foundries, and was a management consulting executive before this appointment. **Danial J. Gentile**, formerly with Wellman Bronze & Aluminum Inc., joined Superior Foundry as industrial engineer.

G. Bruce Wilson was appointed assistant eastern regional sales manager for **Norma-Hoffmann Bearings Corp.**, Stamford, Conn. He was Detroit district manager.

W. B. Blakesley was made assistant district manager, Cleveland, for **C. G. Hussey & Co.**, division of Copper Range Co.

Robert B. Harlan Jr. was appointed marketing manager, Semiconductor Div., **Hughes Aircraft Co.**, Newport Beach, Calif. He succeeds **Jack H. DeKruif**, named assistant to the Hughes corporate marketing director for field office operations.

B. H. Denz was named to the new post of chief construction engineer, **Youngstown Steel Tank Co.**, Youngstown. He was project manager, Plate Erection Dept., Bethlehem Steel Co.

Henry J. Christ Jr. was appointed vice president-operations, **Gabriel Div.**, Gabriel Co., Cleveland. He was purchasing director. In his newly created post, he directs manufacturing, quality control, purchasing, planning, and traffic. **John B. Hamre** was made director of sales, moving to Cleveland headquarters from Millis, Mass., where he served as divisional sales manager.

Raymond C. Kobus was made production manager at **Chrysler Corp.'s** Dodge assembly plant, Detroit. He was manager of manufacturing engineering. He succeeds **E. C. Shawe**, recently named plant manager at Chrysler's St. Louis assembly plant. **E. H. Thorsby** succeeds Mr. Kobus as manager-manufacturing engineering, and **Arthur L. Yahrmatter** was made superintendent of tool and process engineering.

Albert J. Jones was made assistant superintendent, plate and hot strip mills, at the Gadsden, Ala., plant of **Republic Steel Corp.**

Richard Lutz was made sheet product manager, **Aluminum Foils Inc.**, Jackson, Tenn. He has headquarters in New York.

Norbert J. Connors was made Pittsburgh district sales manager, **A. M. Byers Co., Pittsburgh. Morton M. Jenkins** was made assistant to the manager of steel sales.

John J. Giba was made acting manager, Tele-Dynamics Div., **American Bosch Arma Corp.**, Philadelphia. He was acting manager, Chicago Div.

OBITUARIES...

H. B. Newell, president and chairman, **Ohio Forge & Machine Corp.**, Cleveland, died Feb. 18.

William C. Dunlap, 66, manager of purchasing, **New Jersey Zinc Co.**, New York, died Feb. 18.

William H. Kirschner, 54, purchasing agent, **Pullman-Standard Div.**, Pullman Inc., Chicago, died Feb. 24.

Better than New!

View of mill housings in process of re-machining

This Five Stand Tandem Hot Finishing Mill has been in use for many years in the Pittsburgh Area. It is being completely modernized with the latest design features including automatic screwdown, improved anti-friction roll neck bearings, etc. Then the original mill, in better than new condition since equipped with these modern features, will be operated in the Chicago District for many future years of competitive service in the steel industry.

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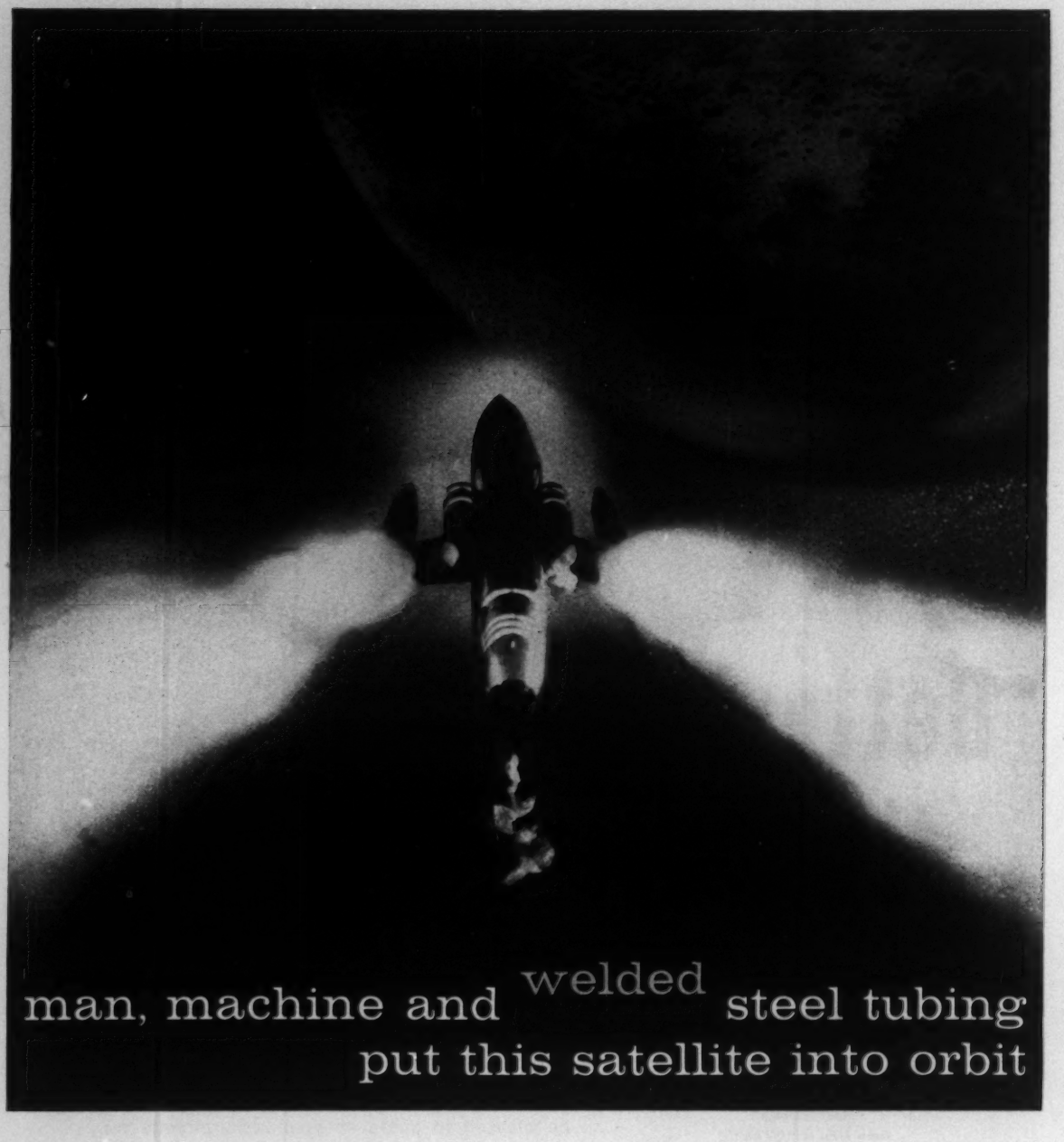
Pittsburgh Steel Foundry Company
TEXTRON, INC.

BOX R, GLASSPORT, PA. · PLANTS AT GLASSPORT & McKEESPORT, PA.



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Alcoa Boosts Output of Enamel Coated Sheets

ALUMINUM CO. OF AMERICA, Pittsburgh, is doubling its capacity for producing enamel coated aluminum sheets. Two paint lines will be constructed at its Davenport (Iowa) sheet and plate mill. The project is scheduled to be completed by late this year.

Expansion was necessitated by a rapidly rising demand for such products as awnings, roofing and siding, venetian blinds, garage doors, and shells for appliances. The firm's recently completed paint line at Alcoa, Tenn., is running at near capacity. It's turning out enameled sheets up to 60 in. wide.

• **Product Range**—The new roller coaters at Davenport will produce enamel coated sheets in widths up to 48 in. They will pretreat and enamel in a continuous cycle. The new product is available in 19 standard colors in thicknesses of 0.019 to 0.051 in. A different color may be applied to each side of the sheet.

A continuous chemical treatment and a subsequent controlled baking cycle enables Tone-Cote finish sheet to resist chipping, flaking, peeling, blistering, and cracking. Company officials add that the combination makes the product ideal for adaptation to forming methods, such as bending, brake and roll forming, blanking, crimping, or flattening, without marring the lustrous finish.

A-C Adds Engine Plant

Allis-Chalmers Mfg. Co., Milwaukee, will build a multimillion dollar engine manufacturing plant at its Harvey (Ill.) Works. The new facility will add 515,000 sq ft of manufacturing space to the present 654,000 sq ft area and will enable the company to build a broad line of diesel, natural gas, butane, and gasoline engines. The plant will be equipped with many new machine tools plus some to be relocated from Plant No. 1. Floor area to be vacated in existing buildings when engine production moves to the new facility will be made available for expansion of Allis-Chalmers material handling equipment production.

Forms Stamco Sales Inc.

Stamco Sales Inc., Cleveland, has been organized as the exclusive sales representative for Stamco Inc., New Bremen, Ohio, in the U. S. and Canada. Stamco, which manufactures a line of metalworking machinery, including equipment for shearing and leveling sheets from coils, has been represented by a variety of sales outlets.

John W. Rogers, formerly director of sales and engineering for Wean Equipment Corp., Cleveland, is president of Stamco Sales Inc. Vice presidents and territories they will represent are: I. W. Spraitzar, Newark, N. J.; William E. Heineman, Chicago; W. H. Millan, Cleveland-Pittsburgh; and R. T. Popp, Detroit. All were formerly associated with Wean Equipment.

Metal Forming Expands

Metal Forming Corp., a division of Vanadium-Alloys Steel Co., Latrobe, Pa., has completed a major expansion program at its Elkhart, Ind., plant. A 24,000 sq ft addition to the mill will provide storage space for finished products and raw materials and will house slitting, bending, and punch press operations. The division rolls strip metal into intricate moldings and produces welded tubing.

Vanadium-Alloys has opened an office at 318 N. Pearl St., Dallas, under the direction of J. J. Hickey. R. D. Bardes, St. Louis district manager, supervises its operation.

Toolmaker Acquires Rights

Illinois Tool Works, Chicago, purchased all U. S. and Canadian manufacturing rights for electronic module and capacitor components developed by ACF Industries Inc. for radio and television circuitry and various defense projects. The Alexandria, Va., facility which manufactures the devices is included in the transaction. It will be operated as the Paktron Div. under the direction of S. S. Cathcart, vice president.

Chemical Firm Expanding

Barium & Chemicals Inc., Willoughby, Ohio, has purchased a 165,000 sq ft plant at Steubenville, Ohio. It will greatly increase the firm's capacity for production of high purity barium and strontium compounds and other chemicals.

Firm Serves Diecasters

Die Cast Machinery Inc. has been established at 409 Earl St., Toledo 5, Ohio, for rebuilding and modernizing diecasting machines. The firm was organized by Joseph Kaul who is assisted by Fred C. Ziesenheim.

Dow Expanding in South

Dow Chemical Co., Midland, Mich., has launched a two year, $30 million expansion program at its Louisiana Div., Plaquemine, La. Construction will include a plant for the production of ammonia; increases in production capacity for chlorine, caustic soda, and vinyl chloride; and additions to power and steam generating facilities. The project will bring Dow's total investment at Plaquemine to more than $100 million, including a $12 million project in progress. A polyethylene plant is scheduled for operation this fall.

Fastener Producer Expands

Huck Mfg. Co., Detroit, is expanding its plant to provide room for large capacity, multistage, heading and rolling equipment. The firm produces fasteners and related installation equipment.

Forms Wirecraft Div.

Turnbuckles Inc., Grand Beach, Mich., formed a Wirecraft Div. under the direction of R. E. Swanson. The division occupies an addition to the plant and is equipped to produce automatic wire forms, flattened and coined wire parts, welded wire assemblies, wire displays, threaded wire hardware, and staple wire products. All products

may be furnished with zinc, cadmium, nickel, copper, brass, or chrome finishes.

Adamas Carbide Expanding

Adamas Carbide Corp., is enlarging its plant in Kenilworth, N. J. The addition will be devoted to the production of tungsten carbide tools, tool tips, dies, wear parts, toolholders, and powders. The new facilities will more than double the plant's capacity.

Widens Container Research

Reynolds Metals Co., Richmond, Va., will build a pilot plant at Bellwood, Va., for development of new types of aluminum containers. The 20,000 sq ft facility, including land, building, and equipment, may cost more than $700,000.

Foil Etching Plant Readied

Republic Foil Inc., Danbury, Conn., will officially open its Electrochemical Div. at Salisbury, N. C., on Mar. 16. Initial production of the division will be etched 99.99 per cent aluminum foil used in electrolytic capacitors, an essential component in the electronics industry.

Manganese Plant Expanded

Foote Mineral Co., Philadelphia, has completed expansion of its electrolytic manganese facilities in Knoxville, Tenn. Additional cells, new rectifying equipment, and other new processing equipment have increased capacity of the plant by 30 per cent.

Divisions Get New Names

H. K. Porter Company Inc., Pittsburgh, changed the name of its Mouldings Div. to Coldform Div. Activities of the division include the production of cold finished structural and decorative parts and subassemblies using highly specialized roll forming, stretch bending, stamping, and welding processes. Basic materials used are stainless and cold rolled steels, aluminum, and brass.

Kaiser Refractories & Chemicals Div., Kaiser Aluminum & Chemical Corp., Oakland, Calif., changed the names of its subsidiaries, Mexico Refractories Co. and Missouri Refractories Co., to Kaiser Refractories & Chemicals Div. The division has opened a sales office at 2901 E. Fourth Ave., Columbus, Ohio, in charge of Glen Ames.

CONSOLIDATIONS

Adolph Plating Inc. purchased **United Plating Corp.**, Chicago. The acquisition boosts Adolph's floor space for electroplating and enameling to 100,000 sq ft.

Sunbeam Corp., Chicago, will purchase **John Oster Mfg. Co.**, Milwaukee, subject to approval of Sunbeam stockholders. Oster makes precision instruments, barber and beauty supply equipment, health appliances, and electrical housewares.

Dayco Corp. (formerly Dayton Rubber Co.), Dayton, Ohio, is negotiating for purchase of **Metal Hose & Tubing Co.**, Dover, N. J., producer of steel and fiber reinforced rubber hose and other industrial hose.

Textron Electronics Inc., New York, acquired **G-C Electronics Mfg. Co.**, Rockford, Ill., and **Schafer Custom Engineering**, Burbank, Calif. G-C Electronics makes electronic components while Schafer designs and builds automation and remote control equipment.

Philip Morris Inc. and **A.S.R. Products Corp.**, New York, will merge, subject to approval of stockholders. A.S.R. products include screw machine items, gears, surgical knives, textile blades, defense components, safety razors, and blades.

NEW ADDRESSES

Ramsey Products Corp., Albany, N. Y., moved its manufacturing facilities to Charlotte, N. C. The company manufactures chain, sprockets, and chain couplings.

Duramic Products Inc. moved to 426 Commercial Ave., Palisades Park, N. J. The company manufactures high temperature tooling.

NEW PLANTS

Albany Products Co. Inc., South Norwalk, Conn., opened a warehouse at 1500 S. Western Ave., Chicago. Stocks will include stainless steel, aluminum, brass, and bronze fasteners. The warehouse will be managed by John R. Tenney.

Hill-Chase Steel Co. of Virginia opened its steel and aluminum service center on Dabney Road, Richmond, Va. Facilities include equipment for flame cutting, square shearing, power saw cutting, and precision roller leveling and cutting. K. W. Gay is manager and C. H. Martin Jr., manager of product sales.

Viking Wire Co. Inc. is operating its new 40,000 sq ft plant in Danbury, Conn. The company is producing nine basic magnet wire products.

Caine Steel Co., Chicago, formally opened its expanded steel service center at 1315 Chattahoochee Ave. N.W., Atlanta, Ga. The new addition raises plant area by 56 per cent to a total of nearly 50,000 sq ft.

NEW OFFICES

General Aniline & Film Corp., New York, is building a branch sales office and distribution center in South San Francisco, Calif.

New Britain Machine Co., New Britain, Conn., opened sales facilities for its New Britain-Gridley Machine Div. at 650 W. Duarte Rd., Arcadia, Calif. Henri Kaspar is sales representative. The San Francisco area office has been established at 1824 Lakeshore Ave., Oakland, Calif., in charge of John Sullivan.

Boiler Div., Babcock & Wilcox Co., Barberton, Ohio, is establishing a district sales office at 1700 Broadway, Denver, Colo. R. L. Swinney is district sales manager.

Vapor Recovery Systems Co., Compton, Calif., opened a district office at 10542 San Pablo Ave., El Cerrito, Calif. James L. Caler is district manager.

Fourth Conference on Manufacturing Automation

TO BE HELD AT

Purdue University, Lafayette, Indiana
April 11, 12, and 13, 1960

For production executives, manufacturing engineers, and administrative managers who plan, design, and install automated systems for industry.

As in past conferences, informal discussion groups will be set up where automation authorities will be available to answer specific questions and exchange experiences. Exhibits of automation components and systems have also been arranged.

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AUTOMATION

FEE

Fee for the Third Conference on Manufacturing Automation is $85 which will include the Banquet, the noon Luncheons, and a copy of the Transactions.

LODGING

Rooms are available at the Union Club on the campus at $4 and $6 single, $6 double, and $7 to $9 twin. Room reservations may be made with the Union Club by the form supplied. Accommodations are also available at the Fowler Hotel in Lafayette (city bus to campus) from $3.50. Write direct. For those driving, reservations may be made at the Morris-Bryant Motel, Cedar Crest Motel, or Green Acres Motor Court (2-4 miles north on U. S. 52). For additional information, write K. E. Glancy, Div. of Adult Education, Purdue University, Lafayette, Ind.

CONFERENCE TOPICS AND SPEAKERS

Engineering Costs—Who Pays? (Automation Panel)

BUYERS K. C. BUTTERFIELD, Staff Master Mechanic, Chrysler Corp.
W. W. KUYPER, Manager, Manufacturing Engineering, Large Steam-Turbine Generator Dept., General Electric Co.
R. L. SCHOENBERGER, Manager, Production Engineering Dept., R. R. Donnelley & Sons Co.
W. A. STADTLER, Director of Manufacturing Research, I.B.M. Corp.

SELLERS J. R. BAREFOOT, President, Federal Machine & Welder Co.
LEO GAJDA, Vice President, Snyder Corp.
E. McFERREN, Vice President-Sales, Giddings & Lewis Machine Tool Co.
W. K. STOKES, Vice President-Sales, Alvey Ferguson Co.

Manufacturing Research and Automation
T. R. BUNNELL, Manager of Manufacturing Services, Semiconductor Div., Sylvania Electric Products Inc.

Getting a Grip on Costs and Payoff
K. H. MEYER, Manager, Mfg. Services, Reliance Electric & Engineering Co.

Organizing to Reduce Costs through Automation
C. D. EVANS, Ass't. Manager, Mfg. Research, International Harvester Co.

Process Analysis and Machine Procurement
H. A. LEONE, Manager, Headquarters Mfg. Lab., Westinghouse Electric Corp.

Automating Assembly
C. H. STANDISH, President, Designers for Industry Inc.

Integrating the Packaging Operation
WILLIAM WOOD, President, Processes Research Inc.

Techniques for Parts Handling
R. H. BONNER, Application Engr., Industrial & Machine Tool Operations, Radio Corp. of America

Dispensing Problem Materials in Process
L. E. HARPER, President, Omega Machine Co. Div., B-I-F Industries Inc.

Mechanization for Distribution
E. J. HARDY, Ass't. Supt., Engineering Equipment Development, Western Electric Co.

Temperature Controls
H. G. PAYNE, Manager, Measurement Group Sales Product Div., Foxboro Co.

Using Relay Control Effectively
ZEKE SMITH, Vice President & Tech. Dir., Potter & Brumfield Div., American Machine & Foundry Co.

Doing the Job with Photoelectrics
J. J. LAREW, Product Engr., Specialty Control Dept., General Electric Co.

LUNCHEON AND BANQUET TOPICS AND SPEAKERS

Pioneering in Automation
W. C. LEONE, Vice Pres. & Gen'l. Mgr., Electronics Div., Rheem Mfg. Co.

You and the MEC
F. I. ELLIN, Chief Production Engr., Ohmite Mfg. Co.

A Look Into Tomorrow
JOSEPH HARRINGTON JR., Head, Mechanical Engineering Section, Arthur D. Little Inc.

Don't Give Up
ROBERT MOORE, President, Moore Equipment Co.

The Inevitability of Automation
H. A. STRICKLAND JR., Vice President & Gen'l. Mgr., Industrial Electronics Div., General Electric Co.

Mail to: AUTOMATION CONFERENCE, Comptroller's Office (Conferences), Purdue University.

ROOM RESERVATION

Please reserve in the Union Club the accommodations checked:

Nights: April 11 ☐ April 12 ☐ April 13 ☐

Single Bed—Bath ☐ Twin Beds—Bath ☐

If necessary, will share twin-bed with another member ☐

Room will be shared by _____

Please send confirmation:

Name _____

Company _____

Address _____

CONFERENCE REGISTRATION

The following persons plan to attend the AUTOMATION CONFERENCE, April 11, 12, and 13, 1960 (name and title, please):

Name _____

Title _____

Name _____

Title _____

$_____ is enclosed for the registrations checked at $85 each. (Make checks payable to Purdue University.)

☐ Fees will be paid at registration time.

Name _____

Company _____

Address _____

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STEEL

Technical Outlook

MORE METAL MUSCLE— Steels 20 times stronger than today's best may soon be on your doorstep. Reason: Zone refining. Experimenters have purified iron and its alloying elements with the process, then combined them in a zone refining furnace (via diffusion). Not only have certain government agencies verified the results, several big steel firms are hard at work on the idea.

GRINDING GROWTH— Extremely close tolerances in the exotic metals encountered in many shops offer a brand new market opportunity for manufacturers of grinding wheels, thinks George P. Burns, vice president, Van Norman Machine Co., Springfield, Mass. He cites crush forming as an important new technique requiring new types of wheels.

PINPOINT BRITTLE BUG— Why does hydrogen make metals brittle? When adsorbed in steel, for example, it reacts with graphite even at room temperatures to form methane, acetylene, and some high paraffins. That builds up extra internal pressures and removes carbon atoms from their metal-strengthening positions. The evidence was accumulated by chemists at Stanford Research Institute, Menlo Park, Calif. Significance: The new knowledge probably is the key to faster solutions to specific embrittlement problems.

INDUCTION CARBURIZING— Induction carburizing and brazing at one crack is the object of engineers at the Induction Heating Laboratory, Lindberg Engineering Co., Chicago. Early trials are focused on a small gear-hub combination. Parts are stacked on an Inconel bar inside a quartz tube. Copper brazing takes place at 2050° F in dissociated ammonia. Natural gas follows at 1900° F for 10 minutes. The hope: 0.020 to 0.025 in. case on SAE 8620 steel.

NEW CHROME PLATING— A plating line under development will lay down a bright, crack-free, chrome surface more cheaply than conventional copper-nickel-chrome plating lines, a reliable source tells STEEL. Officials of the General Development Corp., Columbus, Ohio, claim its important features will be improved corrosion resistance of the plating and the greatly improved throwing power of the plating solution. The advantages are said to accrue from lower plating temperatures and a new type of rectifier.

SQUARE D LOGIC— Standard, transistorized units (based on a "nor" logic element) make up the new electronic brain control systems being made by Electric Controller Div., Square D Co., Cleveland. It can be applied to numerical positioning systems or to any other sequencing or interlocking control problem.

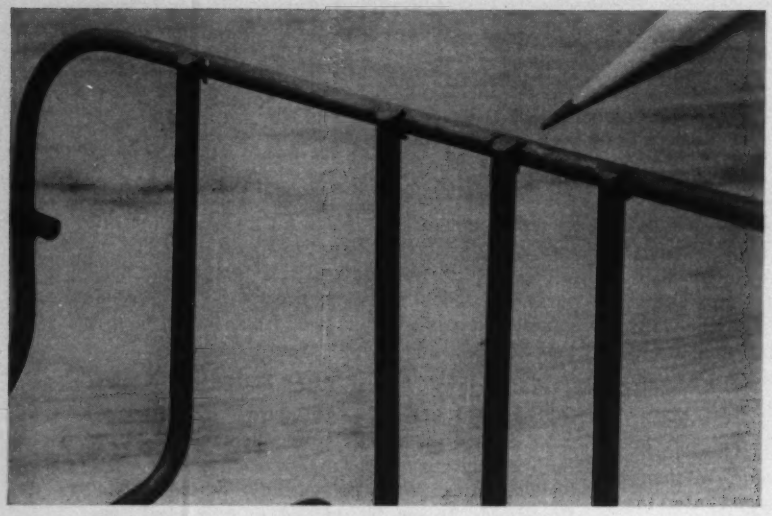
ROUGH, TOUGH COATINGS— Among the materials being tried for hard, oxidation-resistant coatings are chromium carbide, titanium carbide, tungsten carbide, and chromium boride, reports Union Carbide Metals Co., a division of Union Carbide Corp., New York. Applied with metallizing and flame spraying techniques, they are used either pure or with metal binders.

PRETTY PURE STUFF— How well cathodes work in vacuum tubes depends on trace impurities in the metal, states K. M. Olsen, Bell Telephone Laboratories, Murray Hill, N. J. It reports it has made a 1500 lb batch of nickel with no single impurity greater than 50 parts per million.

FORGED CASTINGS— Forging precast turbine buckets improves fatigue resistance of the surface yet leaves the core with the high rupture values of the as-cast metal structure. The phenomenon has been adequately verified by extensive stress-rupture tests and actual engine test runs, says Steel Improvement & Forge Co., Cleveland.

TEMPERED ALUMINUM— A new process is said to increase the strength and reliability of some aluminum-magnesium alloys, says the Aluminum Co. of America, Pittsburgh. The firm claims the treatment assures top resistance to stress corrosion in 5456 and 5083 alloys.

Plastic Powder Coating



Dresses Up Metal Parts

FLUIDIZED BED coating of metals with plastics shows commercial promise, reports the Whirlclad Div. of Polymer Corp., Reading, Pa. The method (see STEEL, Jan. 4, p. 286 and Feb. 22, p. 67) employs no solvents and uses finely divided resin particles suspended by fluidization with gas or air in an enclosed tank.

Advantages reported include the ability to use solvent-resistant plastics such as nylon, good coverage of sharp edges and corners, a smooth surface, and the formation of heavy coatings (0.005 to 0.050 in.) with a single immersion of the part.

• Parts are preheated, then dipped in the fluidized bed of resins; a layer of the resin adheres to the metal.

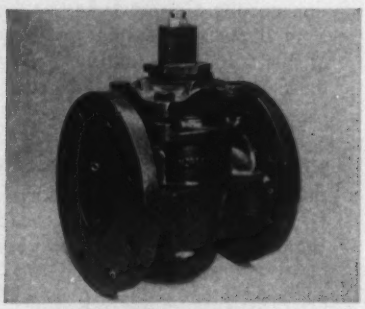
The principle has been employed in cracking catalysts for oil refineries and in the processing of ore. It can be demonstrated with many finely divided substances. For example, when face or bath powder is shaken in a glass, so that some air is mixed in, it momentarily flows like a liquid. As the powder settles by its own weight, the fluid-like action disappears. In fluidized bed processes, the air or gas is introduced at the bottom of the vessel continuously, so that the solid particles do not settle out.

Control of the nature of the bed (which actually contains no liquids) depends on many factors. Particle size of the material to be suspended is one; methods to obtain the powder fineness required are necessary before the bed can be formed. Other factors include air or gas velocity and the densities of the particles and the gas.

Basic procedures and apparatus for the system were developed by Knapsack-Griesheim AG, of Frankfurt, Germany, says Walter R. Pascoe, Whirlclad's technical manager. Patents have been issued (and others are pending) on all basic features of the apparatus and process.

• The preheating temperature of the metal is above the melting range of the plastic used for the coating.

For commercial applications, a continuous preheating oven is used. Work is racked singly or in multiple, depending on size. Batch ovens handle intermittent work, or experimental runs. The preheated parts are removed from the oven and dipped into the fluidized resin bed. They are moved back and forth in the bed; the lateral motion is needed to get uniform coatings.



Chlorinated polyether coating on this Rockwell Mfg. Co. valve adds chemical resistance to the metal's strength

In Polymer's Whirlclad coating system, individual particles of the resin touch the hot metal. On contact, they fuse and cling to the surface. An area not immediately reached by a particle will remain hot until the resin covers it, says Mr. Pascoe.

• Thickness of the coating can be determined by adjustment of the temperature of the part and the time of immersion.

Heat content of the work, if the parts are heavy, might cause coatings to be thicker than desired if they were left to collect as much resin as possible. So they are removed after a suitable time in the mobile resin suspension. Thinner parts may require a higher temperature to assure the proper thickness. And coated work may be reheated on the surface and dipped a second time to build even heavier layers.

The resin in the special container used to form the fluidized bed is not heated, and the total heating time for the particles of plastic which contact the metal parts is short. So work can be preheated safely at higher temperatures than the plastic could withstand if it were to be melted for coating.

• Postheating fuses the powder particles into a smooth, continuous coating.

Heavy parts often retain sufficient heat so that postheating is not required.

Example of the use of a vinyl coating: A welded wire unit which is the juice can rack in a refrigerator-freezer. Bauer Bros. Co., Springfield, Ohio, uses a special ice-blue coating to match the interior decor of the unit.

Parts are ganged in groups of six and automatically cleaned and primed on their way to the preheat oven. The cubical oven is 50 in. on an edge. On reaching temperature, the ganged parts are removed from the oven and dipped; normal dipping cycles are between 3 and 20 seconds, depending on the nature of the part and the thickness required.

• A uniform 10 mil coating is applied by the single dip; postheating completes the operation.

The use of the fluidized bed coating has made it possible to eliminate deburring, polishing, and grinding steps, yet produce a quality finish. Coating covers the stamped edges, weld flash, and wire ends; use of vinyl provides good resistance to impact at the low temperatures of the freezer.

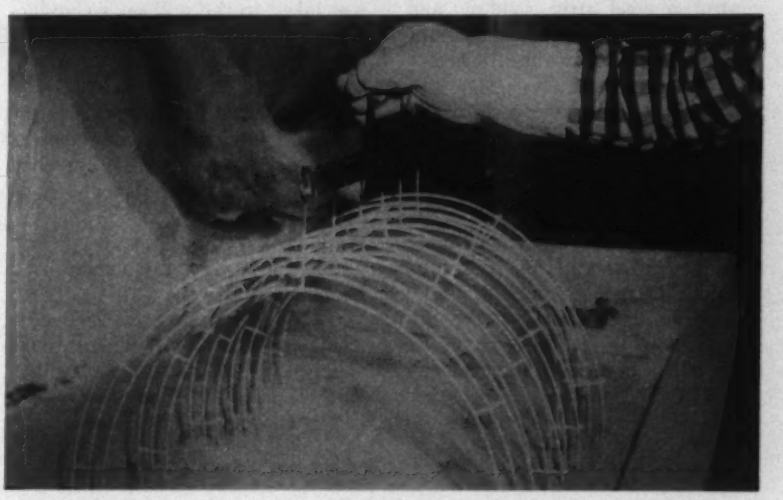
Design changes which brought a reduction in cost were made possible by the coating process.

• The process may be applied on a custom basis in a wide range of plastics.

Both thermosetting and thermoplastic polymers can be applied. The list of powdered products available includes cellulosic, vinyl, nylon, polyethylene, chlorinated polyether, and epoxy types; colors are incorporated in the resin before powdering to permit colored coatings. With some materials, such as the cellulosics, transparent colors can be obtained.

Whirlclad Div. has set up a custom coating plant at Santa Ana, Calif., and other shops are now entering the field. They will handle job lots and trial runs for plants that do not have their own coating facilities.

Preheating oven heats parts to a temperature above the melting point of the plastic used for coating



Preheated part is dipped in fluidized bed of plastic powder, moved laterally, then withdrawn

• An article or advertisement in STEEL can earn you $1000. For the how to—See Pages 5 and 6.

Control Package Expedites Mill Revamp

All components are installed and interconnected at the factory. Unit can be tied to power cables and control wiring at the mill site in three to five days

READYMADE control rooms, with components installed and interconnected at the factory, are expected to gain favor in heavy industry. They should speed the startup time of new or revamped processing lines.

A 14 ton, packaged system, supplied by Electric Controller & Mfg. Div., Square D Co., Cleveland, will control a steel strip welding and coiling line at the McDonald, Ohio, mills of United States Steel Corp.

• The control package costs slightly more than a comparable open panel system, but faster installation cuts over-all cost.

The setup sells for about $150,000—20 per cent more than the 12 open panels it replaces. But total savings on installation and testing will more than make up the difference, says W. H. Peter Jr., a vice president of Square D and manager of E C & M Div.

The package can be installed in three to five days vs. four to five weeks for a conventional control setup. It is made under closely controlled, in-plant conditions, so parts aren't damaged before they are installed.

• A rigid steel frame insures safe shipment and installation.

The 21 by 14 by 8 ft structure was taken to the mill on an underslung highway trailer. It could be shipped longer distances on a railroad flatcar.

The room will be placed over an open pit that contains main power cables and control wiring for connection to panel terminals.

• Main drives use direct current; alternating current motors are used for auxiliary drives.

Use of direct current at 230 volts, available from the present shop supply, helped hold down initial cost of the line. The process uncoiler and leveler is driven by a 350 hp motor; 125 hp motors drive the main pinch rolls and the upcoiler at the exit end of the line. A transformer and selenium rectifier panel in the control room provides 40 volt direct current for jogging and threading.

Motor control centers provide protection for alternating current motors used on the line and permit remote operation.

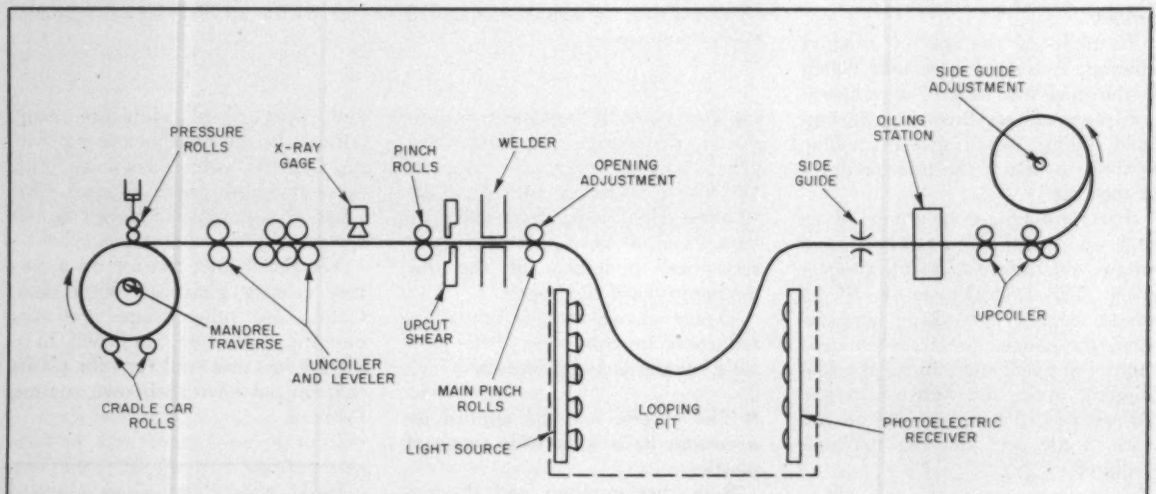
The line will be operated by three men from individual control desks, including a master desk at the middle of the line.

• The line will make larger coils available to fabricators, permitting longer production runs.

Incoming coils of hot rolled strip will be uncoiled, leveled, and end sheared. Short strips will be butt-welded, forming one large coil weighing up to 30,000 lb.

An x-ray thickness gage ahead of the shear will detect offgage material, so it can be removed. An oiling station will put a protective film on the strip, which can then be banded for shipment.

Tension between the uncoiler and the main pinch rolls will be controlled automatically.



Power for all drives and regulation for all controls are handled by a preassembled system on U. S. Steel's welding and coiling line at McDonald, Ohio

Announcing the WINNERS

OF STEEL'S 1959 COST CRISIS COMPETITION

TEN metalworking companies have been selected for their skill in adapting materials to help them meet one of metalworking's most critical, continuing challenges: The cost crisis.

The ten were picked from a host of entries in STEEL's competition by metalworking managers who represent a cross section of the industry. Each winning company will receive a Cost Crisis Award, an inscribed Atmos perpetual motion clock.

The accomplishments of these companies range from the simple substitution of one alloy or shape for another to complete product redesign to take better advantage of material technology.

Entrants in the competition answered these questions:

1. What was the cost problem?

They told: The product and materials involved, plus costs which were out of line.

2. What was the solution and how did you find it?

Entrants described the steps tak-

These Ten Managers Submitted Their Companies' Winning Entries In the Cost Crisis Awards Competition

en in analyzing the problem and determining a solution, then told who took part in the project.

3. Where was the cost cutting achieved?

In some cases, the price of purchased materials was reduced. In many others, material costs remained unchanged or even went up; offsetting economies were realized in processing.

4. What are the "before" and "after" unit product costs?

Savings were spelled out in dollars.

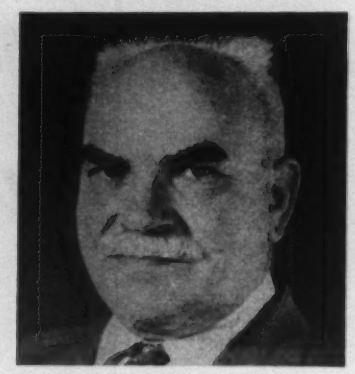
Winning entries were among those published in STEEL during 1959. A panel of 40 metalworking managers (representing a variety of job titles and large, medium, and small plants) evaluated all top entries.

Awards will be presented this month. Managers who submitted the entries will receive framed Award Certificates.

LEE MERZ, tool liaison engineer
Sylvania Home Electronics Div.
Sylvania Electric Products Inc.
Batavia, N. Y.

Changes in Materials Lower TV Set Costs

Chassis pans, plated after forming, cost 32 cents each. Made from terne plate, they cost slightly more than 21 cents. In two years, the company saved $55,000 on this part. On another type part, punched cabinet covers, purchasing is saving the company $50,000 a year by buying stock sheet metal and contracting with a stamping supplier for the work.



ELMER H. SNYDER, chief metallurgist
Austin-Western Works
Baldwin-Lima-Hamilton Corp.
Aurora, Ill.

New Steel Prunes Cost Of Auto Components

Resulfurized steel did the job. Saved: $1.09 on a pivotshaft, 71 cents on a valve plug, $1.09 on a ball stud, and $1.91 on a driving hub. On three of the parts, the machining costs dropped. On the fourth, the valve plug, machining costs are slightly higher than they were when 1117 steel was used, but heat treating and straightening costs are down.

ARTHUR H. MILLER, advance planning engineer
Goss Co., division of Miehle-Goss-Dexter Inc.
Cicero, Ill.

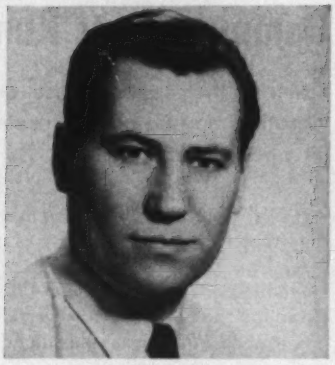
Powder Metal Parts Save $13,017 a Year

Six small parts (three spring retainers, a pinion, a gear, and a worm wheel) used to be made from steel bar stock. Purchased in quantities of 20,000, total cost for the parts came to $21,000. Total cost, for the same quantity, has plummeted to $8183 a year. Both the purchase price and processing costs are down.

A. A. IACCO, sales manager
Beaver Tool & Engineering Corp.
Gaylord, Mich.

Prehardened Steel Cuts Tool Costs 25%

As many as two separate heat treat operations and subsequent retappings and honings have been eliminated by specifying a preheat treated 4150 type steel alloy. The over-all saving (despite increased material costs) has helped keep boring bars and other tools made by the company at a competitive price.



HEINZ G. MARX, plant & production engineer
Ex-Cell-O Corp., Bluffton, Ohio

Design Analysis Group Trims Component Costs

A design study followed by new material specifications has led to 15 per cent cost cuts in products. On four parts cited: A wrench costs 30 per cent less to make as an assembly than it did as one piece; a fabricated gib costs 48 per cent less than a one-piece gib; a fabricated steel sprocket costs 77.5 per cent less than the former forging.

JOHN MIKULAK, asst. to vice pres. of mfg.
Worthington Corp., Harrison, N. J.

Castings and Welding Halve Material Charges

Cases of compressors used to be made from large, complex castings that were relatively expensive and cumbersome to process. Now the cases have been broken down into relatively simple castings; rolled plates are used where they are practical. A compressor case now consists of a welded assembly of properly selected components—one model costs $339.90 less than it did.

CLIFFORD MECHLING, steel products buyer
Dodge Mfg. Corp., Mishawaka, Ind.

Galvanized Sheets Cancel Plating Need

Stamped housings for pillow blocks and flange bearings are made from galvanized sheets that cost $1.25 per 100 lb more than bare stock. Savings are brought about by eliminating a subcontract zinc plating step and reducing handling costs. Savings more than offset the increase in material price. Added benefit: The coating holds up under severe stamping.

THOMAS G. HARVEY, physical metallurgist
U. S. Naval Avionics Facility
Indianapolis

Magnetic Ingot Iron Crops Gyro Costs

Nickel iron was specified for critical housings and inner poles of military gyros. Engineers found that the inner pole would cost $14.75. Substituting ingot iron, they cut both material and machining costs—dropped the total to $9.43. Material costs for the housing were 85 cents. They were trimmed 88 per cent (to only 10 cents).

THOMAS J. BOWES, methods engineer
Remington Rand Div., Sperry Rand Corp.
Tonawanda, N. Y.

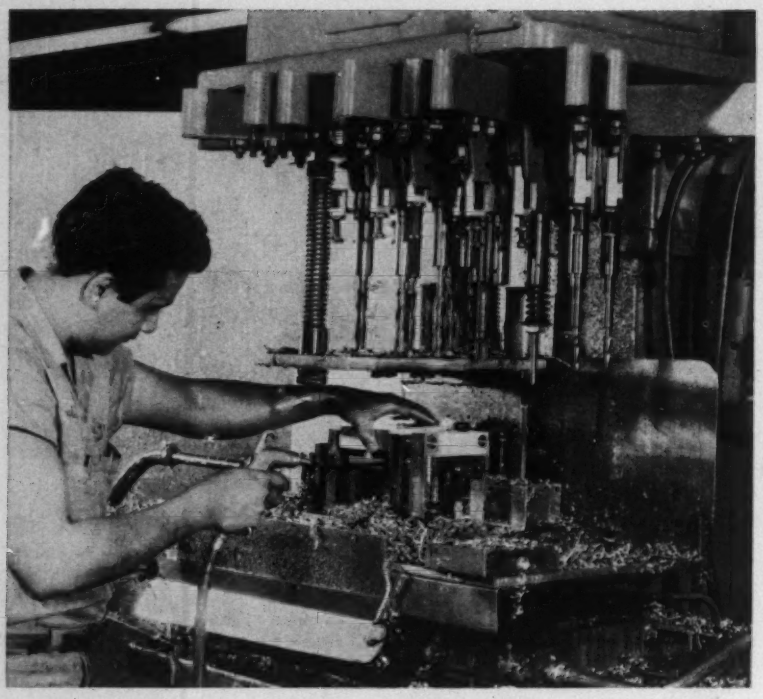
Product Is Redesigned; Saving: $16,887 a Year

A price cut by a competitor forced a re-evaluation of the company's product—a safe file; the study led to savings of nearly $17,000 a year with no sacrifice in quality. Economies were realized via the insulating operation and a concurrent reduction in the cost of the insulating materials, the company reports.

E. J. LIEVENS, stamping plant manager
Studebaker-Packard Corp.
South Bend, Ind.

Killed Steel Stock Aids Auto Stamper

Initial runs of quarter panel housings for 1959 Larks showed a high scrap and repair rate. The solution: A material with better drawability. Engineers specified higher quality killed steel. Despite $17,929 higher annual cost for the material, savings in scrap, welding, and metal finishing came to $42,055 for the model year.



One operator loads and unloads fixtures in this multiple spindle drill. He can turn out up to 45 parts a minute on the smaller pieces

Multispindle Drill Doubles Firm's Output of Housings

ALUMINUM end housings for pneumatic and hydraulic cylinders are drilled and tapped with a standard multiple spindle drill and some versatile tooling at Alkon Products Corp., Hawthorne, N. J. The company says the method is twice as fast as the one it replaced and has improved quality. Also, the equipment takes up less floor space.

J. C. Gurmendi, president of Alkon, says, "The drill setup is ideal for pipe taps. With an oil base coolant, we get a top rate finish."

• A single fixture mounted on a sliding table handles all operations. Three faces of the workpieces are machined at the same time.

Each end housing has four holes tapped or counterbored through the face and two holes drilled and tapped in one side. Another hole is drilled and pipe-tapped on the opposite side of the housing.

Although Alkon uses only two slide positions, the multiple spindle machine, built by National Automatic Tool Co. Inc., Richmond, Ind., has a five position table. The table can be made to skip, drill, step drill, or tap by setting a control panel which also can select feed rates, depth of feed, and motor speed. Such selection permits easy adjustment of tap loads.

Each fixture is shaped like a block H and holds three parts. One rests horizontally on the crossbar, the other two stand vertically against the legs. Hydraulic pistons hold the parts in the fixture.

Stub locating plugs mate with annular grooves in the rough end housings to properly position the parts.

Damping Tests Run

Material that lessens noise and vibration may be used to protect jet and missile structures

A NEW noise and vibration damping material developed by Lord Mfg. Co., Erie, Pa., shows promise in reducing metal fatigue. Dynadamp, as the material has been designated, is a form of elastomer, a rubberlike substance.

Tests are being conducted to evaluate its ability to protect jet and missile structures and electronic components exposed to high frequency vibration and high intensity acoustic energy.

To be effective, damping material must control resonant responses over a wide range of temperatures and frequencies. Dyna - damp dampens effectively from −65 to 250° F. Temperature sensitivity at both ends of the scale limited previous materials.

Because mechanical and airborne disturbances contain many frequencies, resonant responses affect primary and secondary structures. In undampened structures, that condition can produce amplification of 20 to 100:1. Applying Dynadamp, claims Lord, results in amplification of 3 to 5:1.

• The material is available in structural sections or laminated panels which may be added to existing structures or fabricated as complete damped assemblies.

Structural sections in the form of hats and angle shapes are made by bonding a layer of elastomer between slotted beam sections. This structural feature converts vibration inputs to shear strains which are dissipated in the layer of elastomer. When the sections are attached they can also act as load bearing beams.

Dyna-damp laminated panels consist of plies of metals with elastomer sandwiched between the plates and bonded to them. Weight of a typical 20 in. by 20 in. panel is 1.01 lb per square inch (comparable to an aluminum sheet of similar size). The panels can be punched, sheared, and formed by the usual stretch forming techniques employed in the aircraft industry.

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No weak spots. Because there are no "weak links," you get longer lasting driving power and greater freedom from maintenance than ever before. Take advantage of the balanced driving power only U. S. Royal V-Belts offer. Your "U. S." Power Transmission Distributor has full stocks to service you promptly.

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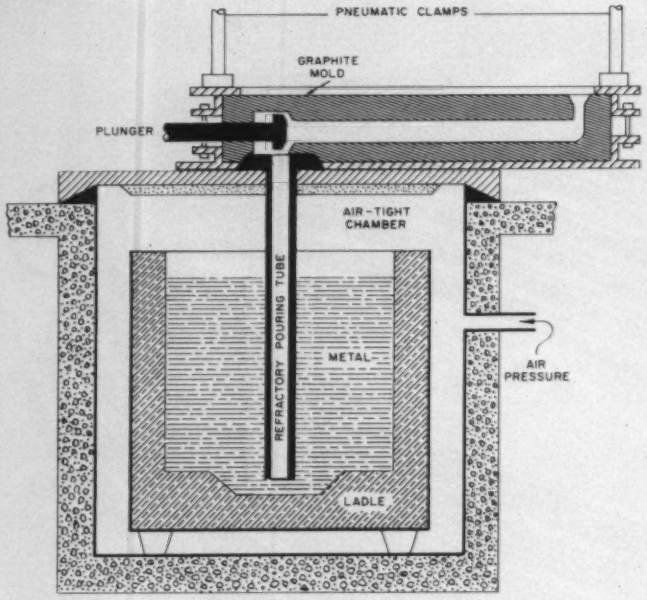

STEEL's editors think a pressure pouring setup for billet making would shape up something like this

Pressure Poured Billets: Shortcut for Steelmakers?

If they can be cast by a method used to make railroad car wheels, several expensive operations in the manufacture of rolled products can be eliminated

A FOUNDRY METHOD, controlled pressure pouring, may be modified to cast some semifinished steel shapes, eliminating the need for soaking pits, blooming mills, and several other types of costly steel plant equipment. Another advantage: Fewer operations on the material would further reduce production costs.

Griffin Wheel Co., Chicago, a subsidiary of American Steel Foundries, uses pressure pouring to make railroad car wheels. It will be tried on a pilot scale at a United States Steel Corp. plant.

• Air pressure forces liquid metal upward through a refractory tube and into a permanent graphite mold.

A ladle containing molten steel is locked on an airtight container. As air pressure inside the chamber is increased, metal from the bottom of the ladle is forced upward through a refractory pouring tube and into a graphite mold, which is secured to the top of the chamber.

When the mold cavity is filled, a refractory plunger shuts off the metal flow, and the mold is removed from the chamber. Unused metal returns to the ladle, and the plunger, which is expendable, remains in the casting.

Graphite molds are used because the material has a low coefficient of expansion, permitting close dimensional tolerances on castings. The material has good thermal shock resistance, and mold cavities are easy to machine.

• The method has been used to cast several semifinished shapes in a variety of materials.

Griffin engineers have used the technique, which eliminates many variables, to cast stainless and carbon steel alloys, boron steels, and nonferrous materials. They have made slabs, billets, and tube rounds (used for making seamless tubes).

Pouring and stripping are done rapidly. A 30 ft billet, 4 in. square, is poured in about 10 seconds. The mold can be removed in 4 to 5 minutes. Most difficult shape cast to date: A 30 ft billet which is 2½ in. square.

• Good surface finish obtained on experimental material makes for less machining is necessary before roll-**shrink heals during rolling.**

Defects on the semifinished shapes are scarce; no scarfing or machining is necessary before rolling, Griffin engineers report. Tolerances are extremely good. Example: Railroad car wheels produced by Griffin aren't allowed to vary more than 1/48 in. on a 33 in. diameter. Only the bore of the wheel requires machining.

Castings show some center line shrink, but it appears to weld up satisfactorily during rolling, says J. R. Drever, Griffin's president. The company doesn't claim it can cast finished shapes because of the shrink, and the casting isn't expected to be as solid as a rolled billet. But subsequent rolling and other finishing operations apparently produce qualities equal to those of standard mill products.

• Pilot plant work will determine whether the method can be applied commercially. It will also permit perfection of pouring practices.

A development contract, signed late last year by United States Steel and Griffin Wheel Co., will permit the corporation to explore adaption of the patented process to the man-

***Experience**—the added alloy in **Allegheny Ludlum** tool steels*

Careful addition of sulfur to melt guarantees typical sulfide distribution, as shown in photomicrograph of longitudinal specimen of EZ MACHINING tool steel.

Sulfur addition to melt held to narrow range in Allegheny Ludlum's EZ MACHINING GRADES

Uniform, finely-distributed sulfides mean uniform machining, uniform high finish, uniform long tool life order after order

Adding sulfur, actually an impurity, to a tool steel melt to make it free-machining must be done with care and precision. That's why Allegheny Ludlum maintains an extremely close average range in adding sulfur to its EZ MACHINING grades. But mere range, however narrow, is not enough. A-L has developed special techniques in adding sulfur and nucleating agents to produce the uniform, finely-distributed sulfides that characterize good free-machining tool steels.

A-L's extra care means you can standardize your machining operations from piece to piece and order to order. This reproducibility is reflected in uniform *machining;* uniform *high finish;* uniform *long tool life.*

For example, in the production of hobs these machining properties in Allegheny Ludlum's EZ MACHINING steels minimize the costly "backing off" operation for back clearance of multiple teeth, eliminating complicated extra heat treatment. Lower residual stresses are set up, because the steel has a lower resistance to the cutting action. Naturally, hobbing is only one of the situations where these free-machining characteristics can benefit you.

Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier. *ALLEGHENY LUDLUM STEEL CORPORATION, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-27.*

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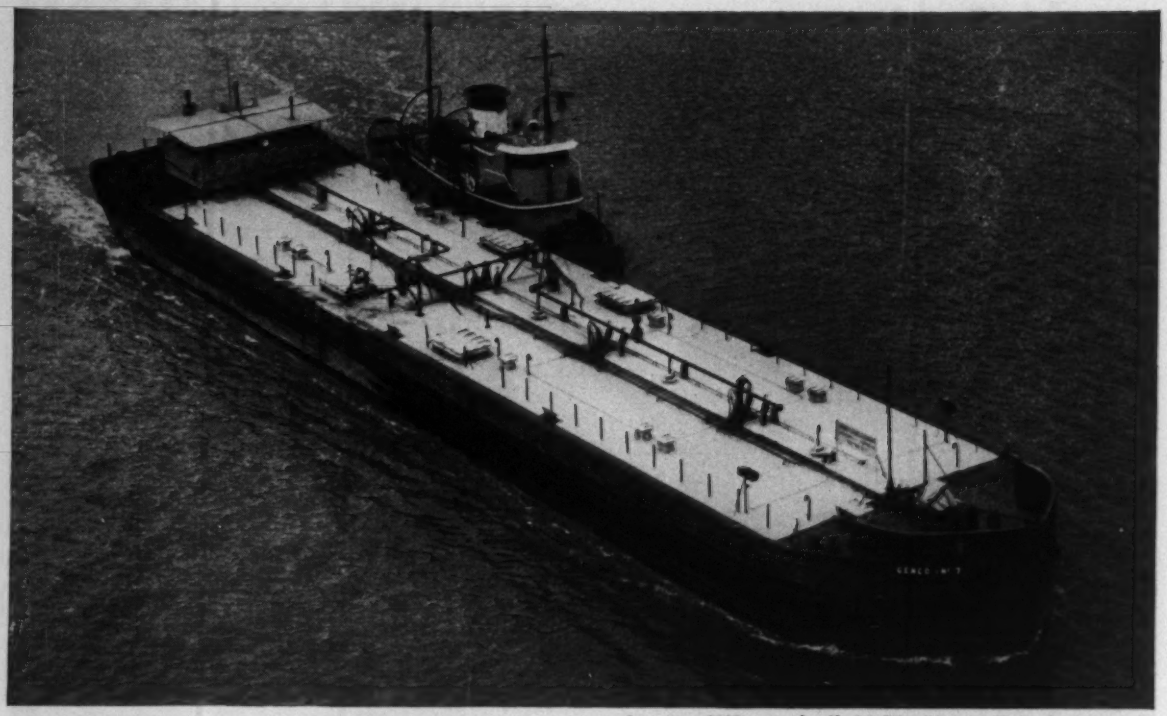

Capacity—2000 tons of sulfuric! *The "Genco 7" is the largest in General Chemical's fleet of eight sulfuric acid barges.*

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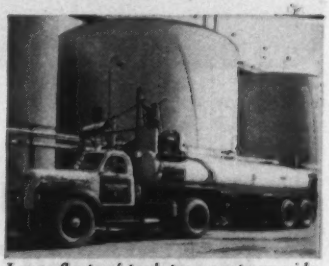
For example, we have eight sulfuric barges serving customers along the Atlantic coast and on inland waterways. Three operate out of Marcus Hook (Philadelphia), Pa. Two in the New York City area, including the 2000-ton capacity "Genco 7" shown above. Three on inland waterways. General also operates the largest fleets of sulfuric tank cars and tank trucks in the country.

General Chemical has 21 sulfuric plants,* as well as stock points in key industrial centers across the country. Each is geared to meet regional requirements, offering customers the advantages of "next door" location to General's modern facilities. In addition, the output of one plant backs up that of another, making a coast-to-coast supply line which proves invaluable in meeting emergencies or unexpected demands.

Why not find out how our long experience and extensive facilities can benefit you? For further information, write or phone the nearest General Chemical sales office.

**In Canada: Allied Chemical Canada, Limited*



Large fleets of tank transports provide fast over-the-highway service.

By far the largest fleet of sulfuric tank cars is operated by General Chemical.

General Chemical sulfuric acid is also available in 13-gallon carboys.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

ufacture of semifinished mill products.

A pilot plant at the corporation's South Works, Chicago, is under construction. One to two years of research may be necessary to determine whether a practical steel production process can be developed.

Several problems must still be solved. Examples: Variables must be determined for specific shapes or alloys; mold design details must be worked out, with particular emphasis on entry angles and contours; the right techniques must be developed for moving molds to and from the pressure pit.

• Application of the process in a tonnage steel plant could make substantial reductions in production costs.

At best, ingot pouring, soaking, blooming, and scarfing could be eliminated. That would reduce capital equipment expenditures and plant operating costs. It would also make for less scrap between melting and final rolling; hot tops and bloom shorts cut steel yield in present practice.

United States Steel officials say it's too soon to determine savings. But an industry consultant optimistically estimates a 15 per cent yield increase and a drop in production costs amounting to $8 or $10 a ton, if the method can be applied commercially.

• Use of the process to make railroad car wheels suggests applications on other casting jobs.

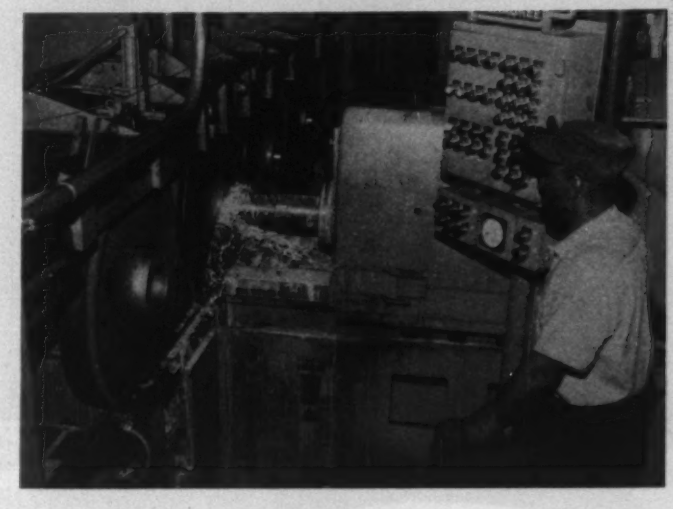
The process has been licensed to Lebanon Steel Foundry, Lebanon, Pa., for the manufacture of valve bodies, turbine blades, and other foundry parts.

Griffin Wheel uses the method to make steel wheels at three plants in the U. S. and at two plants in Canada.

The process is highly adaptable to automation. At Griffin's Muncie plant (8 miles from Kansas City, Kans.) the production line is controlled by three or four men.

Use of electronic controls eliminates cycle variations. Pouring rates (and other pouring factors) can be kept constant from one mold to another. Closely controlled flow prevents washout of the graphite molds.

Machine Work Is Minimized . . .



Car wheels are cast to a tolerance of 1/48 in. on a 33 in. diameter. Only the bores require machining

Slag is removed from metal in the ladle before the pressure chamber cover is put in place

Railroad car wheels are pressure poured (right) and quickly removed from the graphite molds, which are re-used

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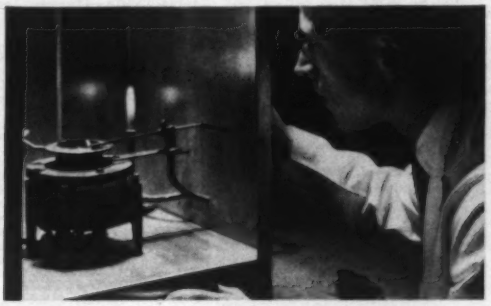

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PALISADES PARK—Philip A. Hunt Company (C)
PERTH AMBOY—Modern Solvents & Chemicals Corp. (M P T)
RIVERDALE—A. H. Mathieu Company (P)
SOUTH KEARNY—American Chemicals, Inc. (C M P T)
VINELAND—Lirio Chemical Company (C P T)

NEW MEXICO

ALBUQUERQUE—Braun Chemical Company (C M P T)
ALBUQUERQUE—Edmunds Chemical Company (C M P T)

NEW YORK

ALBANY—Krackler & Campbell, Inc. (M)
ATHENS—Spick Products Company (P T)
BINGHAMTON—Collier Chemicals, Inc. (P T)
BRONX—Elco Solvents Corporation (M P T)
BROOKLYN—Enequist Chemical Company (C P)
BUFFALO—Buffalo Solvents and Chemicals (C M P)
BUFFALO—Chemical Sales Corporation (C M P T)
BUFFALO—McKesson & Robbins, Inc. (C M P T)
GARDEN CITY—Hogan Industrial Supply Corp. (C M P T)
GLOVERSVILLE—Eastern Chemicals, Inc., S. H. Ireland Div. (C M)
KEARNY—American Chemicals, Inc. (C M P T)
LONG ISLAND CITY—Peerless Oil and Chemical Corp. (C M P T)
NEW YORK—American Chemicals, Inc. (C M P T)
NEW YORK—McKesson & Robbins, Inc. (C M P)
POUGHKEEPSIE—Duso Chemical Company (C)
RENSSELAER—Eastern Chemicals, Inc. (C M)
ROCHESTER—Chemical Sales Corporation (C M P T)
SYRACUSE—Eastern Chemicals, Inc. (C M)
UTICA—Monarch Laboratories (C M P)

NORTH CAROLINA

CHARLOTTE—F. H. Ross & Company, Inc. (C M)
CHARLOTTE—Moreland Chemical Company (C M P T)
CHARLOTTE—Southern States Chemical Co. (C M P T)
GREENSBORO—F. H. Ross & Company, Inc. (C M)

OHIO

AKRON—Farley Solvents Company (C M P T)
AKRON—C. P. Hall Company (C M P T)
CANTON—Bison Corporation (C M P)
CINCINNATI—Amsco Solvents and Chemicals Co. (C M P)
CINCINNATI—Chipman Supply Company (T)
CINCINNATI—Herbert Chemical Company (P T)
CINCINNATI—McKesson & Robbins, Inc. (C M P T)
CLEVELAND—Man-Gill Chemical Company (C P T)
CLEVELAND—McKesson & Robbins, Inc. (C M P T)
CLEVELAND—National Solvents Corporation (C P T)
CLEVELAND—Ohio Solvents and Chemicals, Inc. (C M P)
CLEVELAND—R. W. Renton Company (C P T)
COLUMBUS—McKesson & Robbins, Inc. (C M P T)
DAYTON—Industrial Chemical Products Co. (C P T)
DAYTON—Ottoson Solvents, Inc. (T)
LIMA—Thomson Chemical Company (C M P T)
TOLEDO—Inland Chemical Co. (C M P)
TOLEDO—Toledo Solvents and Chemicals (C M P)
TOLEDO—M. I. Wilcox Company (C P T)
YOUNGSTOWN—Rhiel Supply Company (C M P T)

OKLAHOMA

OKLAHOMA CITY—McKesson & Robbins, Inc. (C M P T)
TULSA—McKesson & Robbins, Inc. (C M P T)
TULSA—Chemical Products, Inc. (C M P T)

OREGON

PORTLAND—Van Waters & Rogers, Inc. (C M P)

PENNSYLVANIA

CONSHOHOCKEN—American Mineral Spirits Co. (C M P T)
EASTON—Lehigh Valley Chemical Company (C M P T)
ERIE—Monarch Laboratories (T)
LEESPORT—R. W. Eaken, Inc. (C M P T)
McKEES ROCKS—Apex Soap and Sanitary Corp. (C P T)
PHILADELPHIA—Alex C. Fergusson Company (C P T)
PHILADELPHIA—McKesson & Robbins, Inc. (C M P T)
PHILADELPHIA—Phillips and Jacobs, Inc. (C M)
PHILADELPHIA—Pioneer Salt Company (C M P T)
PHILADELPHIA—George Senn, Inc. (C M P T)
PITTSBURGH—Carmac Chemical Company, Inc. (C P)
PITTSBURGH—Carman-Pittsburgh Company, Inc. (C)
PITTSBURGH—Ft. Pitt Chemical Company (C)
PITTSBURGH—McKesson & Robbins, Inc. (C M P T)
READING—Textile Chemical Company (C P)
SCRANTON—Scranton Chemical Company (C P T)
YORK—Industrial Solvents and Chemicals Co. (C P T)

RHODE ISLAND

CRANSTON—Giffordline Chemical Company (C M P T)
PROVIDENCE—George Mann & Company, Inc. (C M P T)
PROVIDENCE—Sessions-Gifford Company, Inc. (C M P T)

SOUTH CAROLINA

CHARLESTON—Burris Chemical Company (C P T)
GREENVILLE—F. H. Ross & Company, Inc. (C M)
GREENVILLE—Southern States Chemical Co. (C M P T)
SPARTANBURG—Moreland Chemical Co., Inc. (C M P T)

TENNESSEE

CHATTANOOGA—Chapman Chemical Co. (C M P T)
CHATTANOOGA—Wilson Sales Company (C M P T)
KINGSPORT—Chem-I-Dent, Inc. (C P T)
MEMPHIS—Chapman Chemical Company (C M P T)
MEMPHIS—C. P. Hall Company (C M P T)
MEMPHIS—Ideal Chemical and Supply Co. (C M P T)
NASHVILLE—Chapman Chemical Company (C M P T)
NASHVILLE—Wilson Sales Company (C M P T)

TEXAS

AMARILLO—State Chemical Company (C M P T)
AUSTIN—R. M. Hughes Company, Inc. (C M P T)
BEAUMONT—Arthur Dooley and Son (C M P T)
CORPUS CHRISTI—McKesson & Robbins, Inc. (C M P T)
DALLAS—McKesson & Robbins, Inc. (C M P T)
DALLAS—Texas Solvents and Chemicals Co. (C)
DALLAS—Van Waters and Rogers, Inc. (C M P T)
EL PASO—Baron Chemical Company (C M P T)
EL PASO—Braun Chemical Company (C M P T)
EL PASO—Mine and Smelter Supply Company (P)
FORT WORTH—McKesson & Robbins, Inc. (C M P T)
FORT WORTH—Worth Chemical Products Co. (C M P)
HOUSTON—McKesson & Robbins, Inc. (C M P T)
HOUSTON—W. H. Curtin and Company (P)
HOUSTON—Dixie Chemical Company (C M P T)
HOUSTON—R. M. Hughes Company, Inc. (C M P T)
HOUSTON—Texas Solvents and Chemicals Co. (C M P)
HOUSTON—Van Waters and Rogers, Inc. (C M P T)
LUBBOCK—State Chemical Company (C M P T)
MIDLAND—State Chemical Company (C M P T)
ODESSA—McKesson & Robbins, Inc. (C M P T)
SAN ANTONIO—R. M. Hughes Company, Inc. (C M P T)
SAN ANTONIO—McKesson & Robbins, Inc. (C M P T)
TERMINAL—State Chemical Company (C M P T)

UTAH

SALT LAKE CITY—Braun-Knecht-Heimann Co. (C M P T)

VIRGINIA

NORFOLK—Taylor Salt and Chemical Company (C P T)
RICHMOND—Phipps and Bird, Inc. (C M P T)
ROANOKE—Havnaer Supply Company (C M P T)

WASHINGTON

SEATTLE—Van Waters & Rogers, Inc. (C M P)
SPOKANE—Van Waters & Rogers, Inc. (C M P)

WEST VIRGINIA

BLUEFIELD—Fairmont Supply Co. (T)
CHARLESTON—B. Preiser Company, Inc. (C M P T)
FAIRMONT—Fairmont Supply Company (C P T)
HUNTINGTON—Cabell Chemical Company (C P T)

WISCONSIN

CHIPPEWA FALLS—Lyon Chemicals Co., Inc. (C M P)
LA CROSSE—North Central Chemicals, Inc. (M P T)
LA CROSSE—Wisconsin Solvents & Chemicals Corp. (C M P)
MADISON—North Central Chemicals, Inc. (C M P T)
MILWAUKEE—Benlo Industrial Chemicals Company (P T)
MILWAUKEE—McKesson & Robbins, Inc. (C M P T)
MILWAUKEE—Wisconsin Solvents & Chemicals Corp. (C M P)
WAUKESHA—F. P. Jay Chemicals, Inc. (C T)

See Your Distributor of Dow Solvents First!

User Seeks Tape Control Coding Standard

Company feels builders could enhance multiple machine installations if all systems used the same code for punched tape. Now a programer may need to know three or four systems

MOST numerical control units are standardized in one respect: Machine functions are guided by a punched tape that's 1 in. wide, but another step must be taken, maintain engineers at Miehle Co., a division of Miehle-Goss-Dexter Inc., Chicago.

Coding techniques on the tape can vary widely from one machine system to another. In one case, table X and Y axes information may come first, followed by spindle speed and then feed. In another case (on tape that may look identical), the programer may have to remember a different order of events, a different set of symbols, or a different length block of information for a single operation.

For the user, this can be a real problem. For example, in one department at Miehle, three vertical drilling machines of about the same capacity are within 30 ft of each other. The machines were built by three different builders; they require three different program techniques.

The engineer preparing tape for a part has to know all three systems, remember three different machine capabilities, and can punch the tape only after he has decided which of the machines will do the job.

Equally important: Say the department gets a job a second time. If machine A (for which the tape is prepared) is tied up, the job can't be put on either of the other machines until a new program is laid out and the new tape is punched.

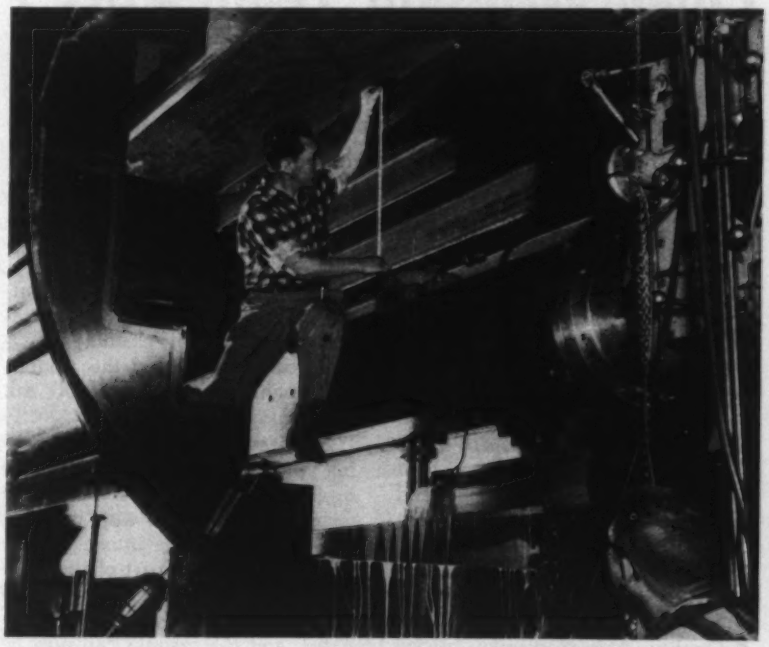
• Standard code for all comparable machines would solve the problem.

Miehle engineers say they feel the step must be taken by machine tool builders, so users can get a maximum return from tape control flexibility. It would mean that a single tape could be the permanent machine director for a specific part —and that the same tape could be used regardless of the machine selected for the work.

The importance of this coding standardization is illustrated in another Miehle department where two large horizontal drilling machines of the same make are already at work. A third machine has been ordered, and it, too, will be made by the same builder.

A deciding factor in the decision to stay with the same builder: The programer can prepare a single tape that can be used to direct any of the three machines.

Despite their concern over the coding problem, Miehle engineers are enthusiastic about tape control. It has nearly eliminated the big job of making and maintaining jigs and fixtures. On one large part, they figure tape replaced about $39,000 worth of tooling—and one spokesman feels that the increase in part quality alone could justify numerical control.



MILLING FIXTURE is held within ±0.001 in. on the interior of a core baffle for the Yankee atomic power reactor being built by Westinghouse's Atomic Power Dept. High speed steel tooling is used to cut the Type 304 stainless steel baffle. The milling head, with its own power source, traverses the length of the fixture box section using a rack and pinion. The outboard end of the fixture is rigidly supported from the shop floor. The fixture was designed and built by R. H. Freitag Div., Alloy Mfg. Corp., Akron, a subsidiary of Salem-Brosius Inc.

Quality team representative (center) works with vender to improve surface finish of casting. Flake size at left is not acceptable, that on right gives best finish (X100)

Quality-Design Team Cuts Product Costs

Constant review of trouble spots fosters improved performance rewards. Example here features a hydraulic pump made by Ford's Tractor & Implement Div.

QUALITY CONTROL should have a voice in design. The impact of such a policy can be tremendous.

Here's an example (involving a hydraulic piston pump) from the Tractor & Implement Div., Ford Motor Co., Birmingham, Mich. Quality control engineers worked with the engineering department and the casting supplier. Besides improving quality, they cut the cost of the body casting by 24 cents, its cover by 15 cents.

• Quality control people insisted on clean castings.

Both the pump body and cover require cores to provide oil passages in the castings. In the old design, burned-in core material was the source of some field problems, many test bench failures, and a high cutter breakage in machining operations. A molten salt cleaning operation removed most of the trouble, but quality control was still not satisfied.

As a result, the pump body casting was redesigned (between the intake oil passage and wobble plate chamber) to permit easy cleaning and inspection. The intake passage is now an integral part of the wobble plate chamber core. Two pipe plugs and the cleaning were eliminated, and the castings can now be made without chaplets (small metal inserts in critical areas).

The outlet passage in the pump cover was also redesigned, eliminating a pipe plug, the chaplets, core wires, and cleaning operation. A new core design reduced core breakage and improved its position in the mold. Ordinary cleaning and inspection are much easier.

• Development and use of quality standards also contribute to cost reduction and quality improvement, say Ford spokesmen. Such standards define the methods used to control adherence to blueprint requirements.

The quality standards also control the cost of repairing a casting. Example: The microinch finishes on machined surfaces shown on the blueprints.

Carbon flake size in cast iron is an important factor in surface finish, Ford research found. At one time, early bearing failure might have become a concern, but investigation soon turned up the culprit. Finer flakes make machined surfaces much smoother. The vender found it comparatively easy to maintain a satisfactory flake size once Ford had established and defined its standards.

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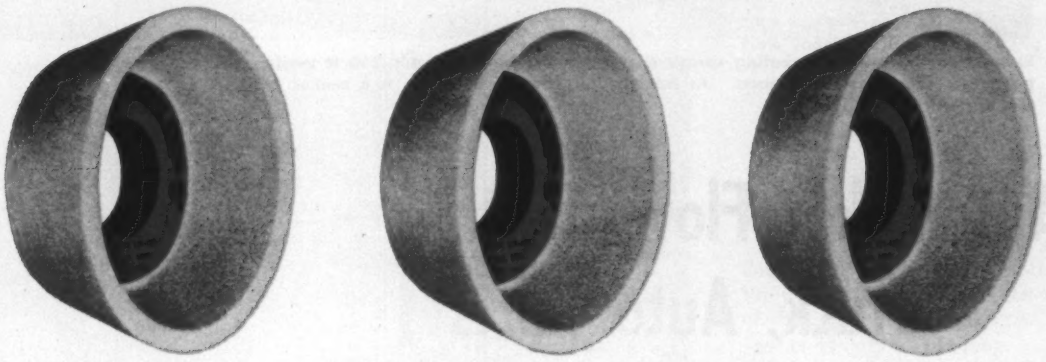

You can depend on a rubber stamp to print identical information time after time after time. You can also depend on the Positive Duplication of these tool-room cup (PD)* wheels—and all CINCINNATI (PD) GRINDING WHEELS.

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To supply you with wheels of uniform excellence, Cincinnati's unique (PD) manufacturing process is unvaryingly regulated by 36 separate quality controls. For example . . . Humidity and temperature of the Wheel Mold Room are kept at the same levels every day throughout the year—an essential safeguard of (PD) uniformity.

RESULT: DEPENDABLE PERFORMANCE

Each (PD) reorder wheel gives you exactly the same good job as the original. Production goes up and stays up. Costs go down and stay down. This is the promise and performance—of Positive Duplication.

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Solve your grinding problems with the help of Cincinnati's factory-trained specialists. Their wide experience in job set-ups and grinding operations is at your service. Just call your CINCINNATI (PD) GRINDING WHEEL Distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

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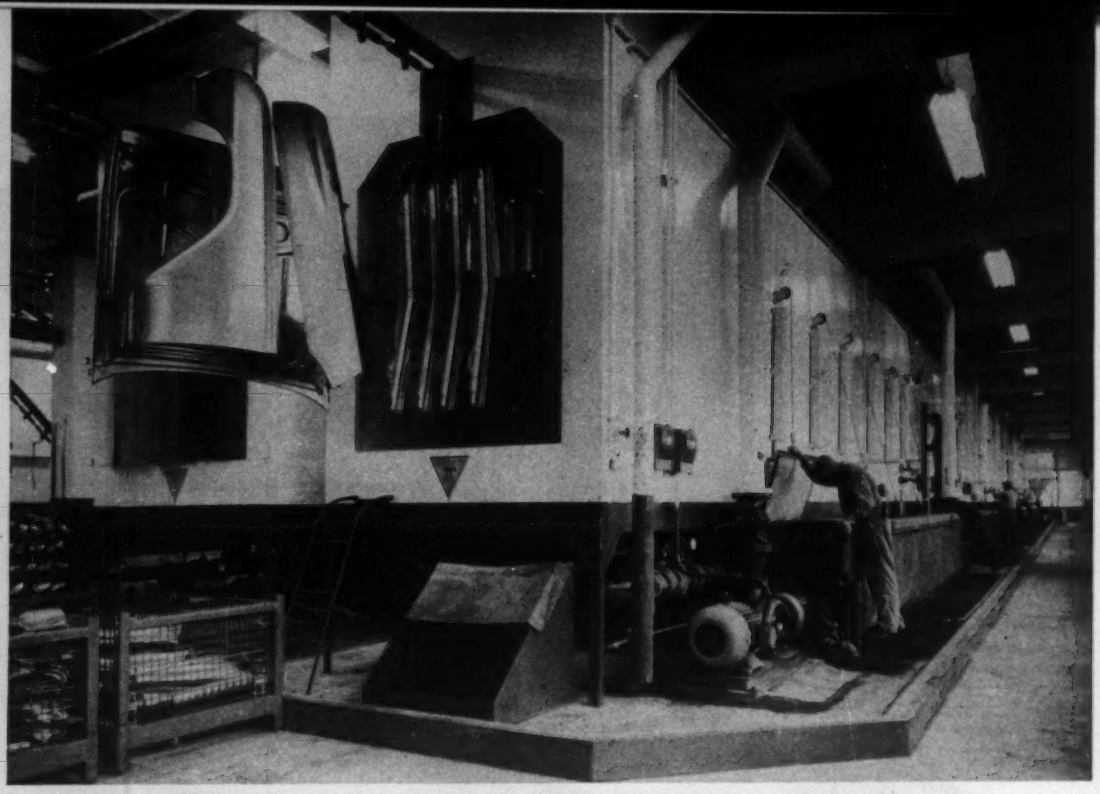
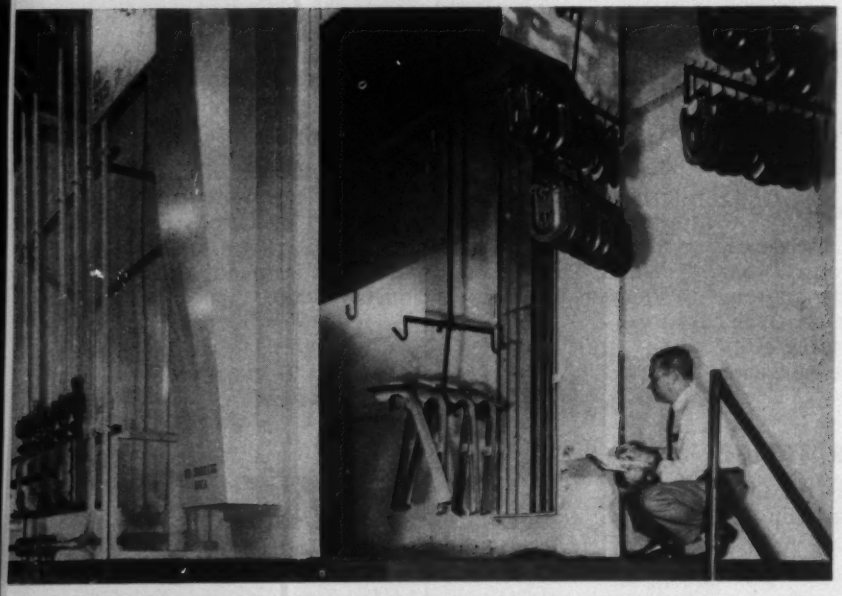


Seven cleaning and rustproofing sprays and rinses are built into this 250 ft washer for passenger car sheet metal parts. At left, partly obscured by parts, is a similar washer for the truck part line

Automaker Flow Coats Truck, Auto Parts



The flow coat machine for truck body parts is 40 ft long and has a 300 ft drip area. A similar machine sharing the common wall (right) is used to flow coat passenger car body parts with paint primer

SUPEREFFICIENT production facilities are providing smooth, even finishes and reducing labor costs at Chevrolet's biggest assembly plant.

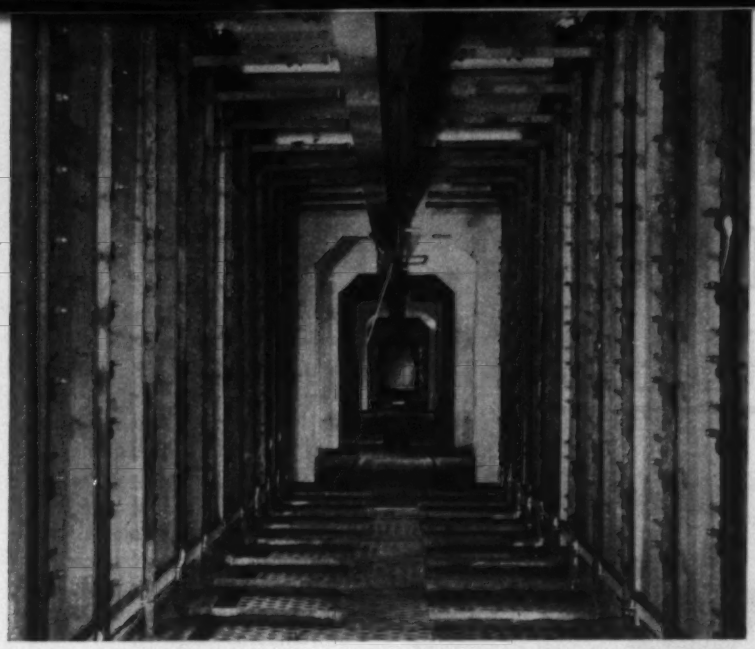
A modernization program at the GM division's St. Louis plant in 1959 included a change in methods for applying paint primer to sheet metal body parts. The dip tank method was replaced by flow coating.

The process provides better rustproofing and more economical use of paint primer. There is less tendency for primer to streak or collect unevenly on the lower portion of parts.

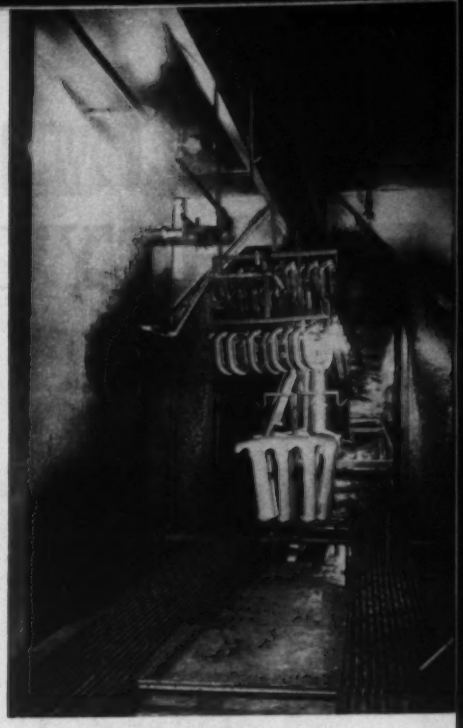
• **Nerve center for the new installation is a pushbutton controlled board.**

It has a start-stop pushbutton for each motor, fan, and pump, and a red pilot light to indicate when the motor starter is energized.

From the board, one operator



Hundreds of spray nozzles clean and rustproof auto body parts in the seven stage washer. It went into operation in June, 1959; the truck part washer started production in October, 1959



Truck parts travel through the flow coat machine on a monorail conveyor. Flow coat area is only 4 ft long

This board is the nerve center for the flow coat machines at Chevrolet Div.'s St. Louis plant. From it, every motor, pump, and fan in the two machines, as well as their air circulating systems, are controlled

controls two flow coat machines (with air supply systems) for the parallel truck and passenger car lines. Passenger car parts include hoods, fenders, and all small sheet metal parts. (The rest of the body is delivered from the adjacent Fisher Body Div. plant.) The truck process line is similar, except that the cab is primed elsewhere in the plant.

Body parts are hung on the overhead monorail conveyors. They enter a seven-stage washer where a protective coating is removed; they are further cleaned in a shower wash of alkaline solution. Parts pass through two rinses, a zinc phosphate spray, a clear water rinse, and a final chromic acid rinse.

The auto part washer is about 250 ft long. Because the truck part line travels at about half the speed of the passenger car line, the truck washer is only 140 ft long.

Parts are dried in separate ovens which operate at the same heat. The auto part oven is longer because of the difference in conveyor speed.

• In flow coating, the parts are flooded with paint primer sprayed from nozzles.

The primer discharges from a 500 gallon tank. After coating, excess primer is collected in the drip area, filtered, and recirculated to be used again. The process coats parts to a thickness of 1 mil regardless of shape.

Each flow coat machine is 40 ft long, including entrance and exit sections. The flow coating area is only 4 ft long. The enclosed drip area is 560 ft long for the passenger car part line—about 300 ft for the truck part line.

The machines were manufactured and installed by Despatch Oven Co., Minneapolis, to the specifications of Chevrolet Div. engineers.

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Crane-Shovel Industry Adopts New Rating Method

The Power Crane & Shovel Association has adopted a uniform method of rating full revolving power cranes. Crane types affected: Crawler, truck, and wheel mounted.

The rating identifies the maximum load capacity and the classification into which the crane falls. Items to consider when coding:

1. Maximum load in tons when hung from the boom at a distance from the cab selected by the manufacturer in accordance with U. S. Department of Commerce Commercial Standards CS90-58.

2. The crane rating radius in feet measured horizontally from the pivotal center of the cab to the suspended maximum load.

3. The rated load (expressed in pounds divided by 100) suspended from a 50 ft boom at a 40 ft distance from the cab.

• **Example**—A truck crane rated at 40 tons at 12 ft radius (distance selected by manufacturer) and at 19,600 lb with a 50 ft boom at 40 ft radius would be classified 40 Ton Truck Crane (PCSA Class 12-196). The figure 40 is the maximum load capacity; the 12 is the rating radius and the 196 the quotient of 19,600 by 100.

In accepting the new rating method, the association feels that disruption in existing manufacturers' methods and rental situations will be kept to a minimum. It also feels that purchasers and users will be better equipped to compare models, mountings, and makers.

Steps are being taken to have the method incorporated in the Commercial Standards of the Department of Commerce.

Scrap Sheared to Length

A hydraulic shear with automatic controls cuts scrap to preselected lengths, eliminating the use of a cutting torch.

Made by Harris Foundry & Machine Co., Cordele, Ga., Model CS-750 is designed to process heavy No. 1 scrap: heavy structurals, bolsters, and center sills for railroad cars.

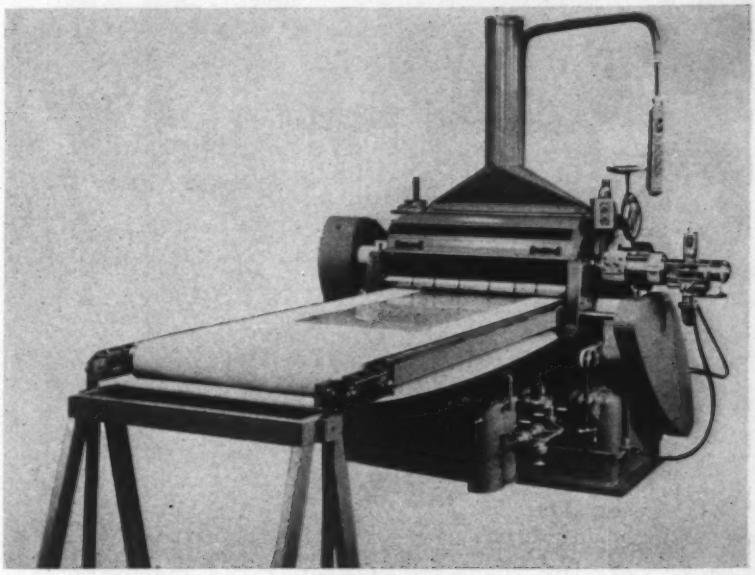
Surface Finishing Unit Handles 2 in. Materials

THIS one pass pinch roll, surface finishing machine has been service tested on metals, plastics, and wood. The pinch roll feed can handle material up to 2 in. thick. It has an infinitely variable linear feed rate within a wide range.

In one service test, the unit removed rust tubercles from hot and cold rolled sheet. In another application, it produced a clean, uniform scratch pattern for maximum adhesion of protective and decorative coatings.

The spindle or backup roll can be changed in about 2 minutes. The unit will accommodate different backup rolls, automatic liquid compound applicators, and synchronized power take-offs for drive conveyors.

For further information, *write* Clair Mfg. Co. Inc., S. Union & Kessler Avenue, Olean, N. Y.

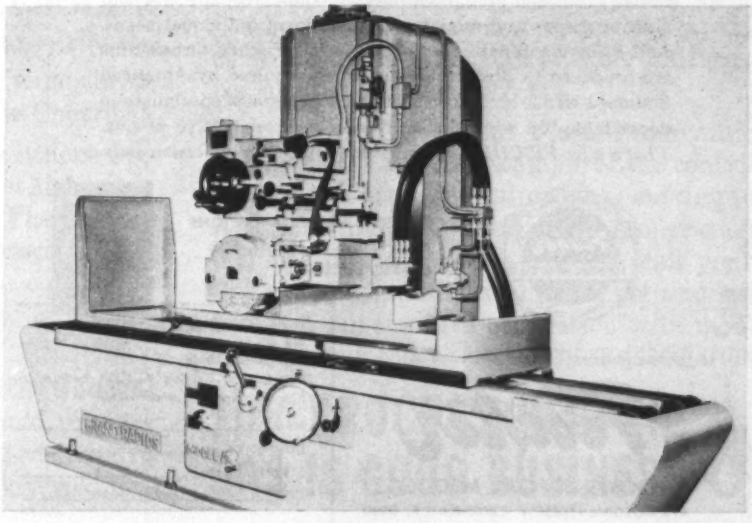


Surface Grinder Has Automatic Cross, Down Feeds

YOU can automatically reproduce transverse forms on large pieces with a Grand Rapids tracer controlled, hydraulic feed surface grinder. It's suited for use on forms too large for a single formed wheel and for materials requiring diamond wheels (where formed wheel cost is prohibitive).

The unit has automatic cross feed and down feed. The cross feed can be preset for rates from 0.008 to 0.040 in. at each table reversal. Total travel is equal to full worktable width.

The down feed removes a preset amount of material (from 0.0025 to 0.060 in.) each time the grinding wheel traverses the width of the work. It's equipped with an auto-



ON YOUR FASTENING PROBLEMS!

If slow-downs in assembly operations are jinxing your production schedules, you can be sure they aren't caused by "voodoo"! But what about the fasteners you are using? If they are not accurate and uniform, they can cause costly bottlenecks.

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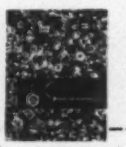

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matic stop so maximum form depth can be preset.

For further information, *write* Gallmeyer & Livingston Co., 400 Straight Ave. S. W., Grand Rapids, Mich.

Motor Controllers Provide Adjustable dc Voltages

ADJUSTABLE voltage for driving direct current shunt motors is provided by a line of motor controllers operating on a 115 volt, 60 cycle, single phase power supply.

Three sizes handle motors with horsepower ratings from 1/100 to 1½. Regulation is about ±4 per cent of base speed. The speed range goes up to 50:1. You can get

remote or local control, dynamic braking, and reversing. High temperature silicon rectifiers provide a 300 per cent increase in the surge safety factor.

For further information, *write* Magnetic Amplifiers Inc., 632 Tinton Ave., New York 55, N. Y.

Rotary Tube Furnace Does Calcining, Sintering

THE Pereny, rotary tube, electric furnace is designed for continuous flow calcining or sintering of ceramic and metal powders. Total hot zone length is 36 in. Inside diameter of the tube is 4⅛ in.; length, 72 in. You can vary rotation up to 6 rpm.

Operating temperatures go up to 2500° F. The unit is capable of a continuous flow workload of 5 to 20 lb per hour. Size of the basic furnace is 64 x 54 x 30 in. The heating elements (18 silicon carbide

(*Please turn to Page* 108)

Greater visibility, trimmer lines for the new CHEVROLET, thanks to GAS! This is Libbey-Owens-Ford, where the new panoramic windshields are made for your beautiful new Chevrolet.

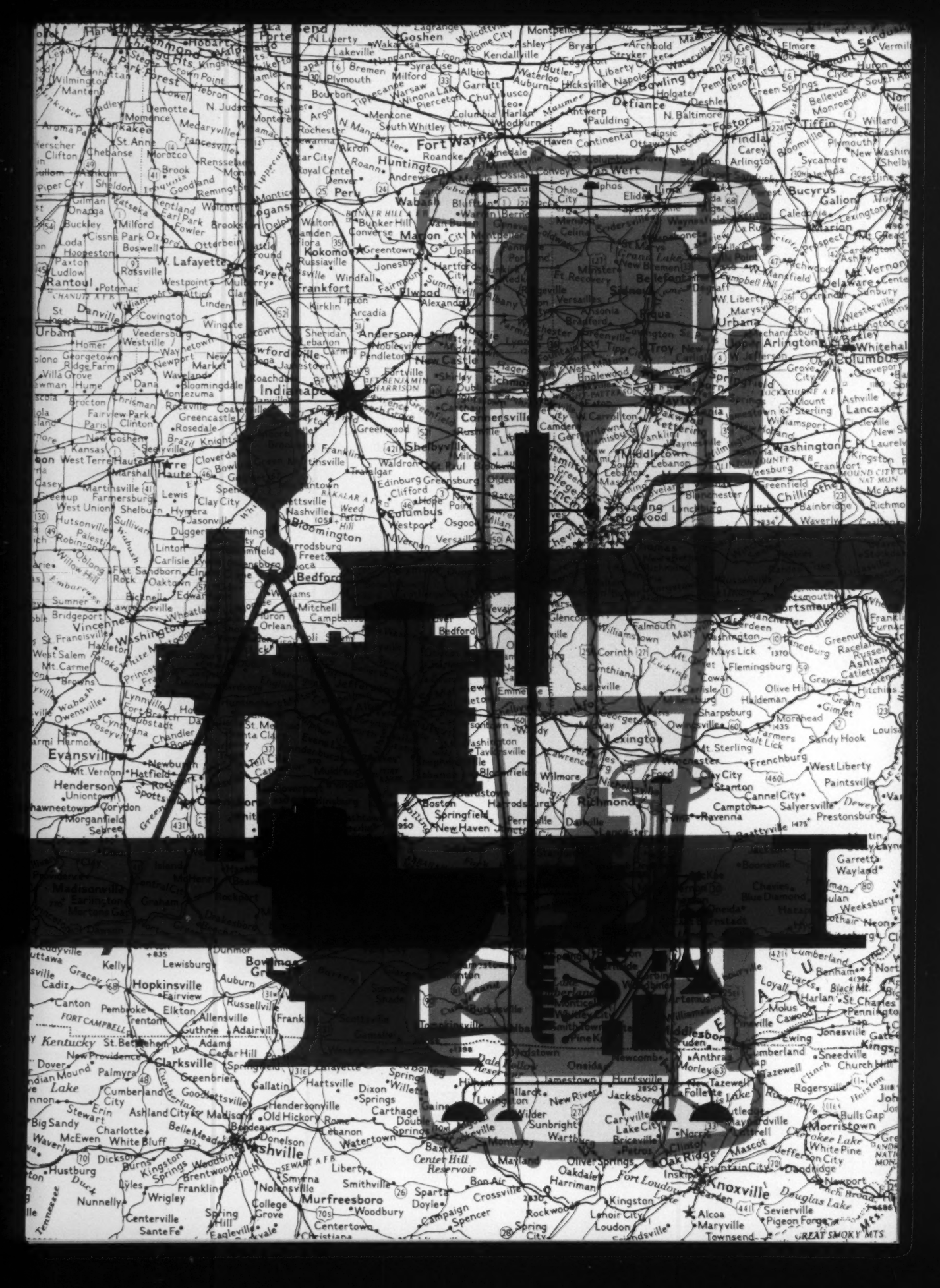
The forming of the curved glass is done in a limited temperature range at which glass can be bent without distortion. The production process challenged heat process engineers to design new automatic equipment capable of mass producing these large precision glass pieces.

LOF engineers, working with General Motors, discovered that Gas could produce the proper time-temperature cycle demanded by this process...efficiently, quickly, reliably.

The flat glass is conveyed under radiant Gas burners which bring the glass quickly up to bending temperature and allow the shaping of windshields, with reproducible uniformity, at high production rates.

The production of the Vista Panoramic windshield is another example of the contributions modern Gas equipment is making to American manufacturing. If your operation includes precise process heating, call your Gas company's industrial specialist and see how you can improve production with modern Gas equipment. **AMERICAN GAS ASSOCIATION**

FOR PROCESS HEATING GAS IS GOOD BUSINESS



(ONE OF A SERIES DEPICTING MARKET AREAS SERVED BY INLAND)

INLAND STEEL IS

HERE

Here, where only a few decades ago the land was dotted but sparsely with small factories, forges, tool shops. Here, where today thousands of miles of highways and railroads fan out in every direction. Here, where today giant factories feed the nation's industries with the machine tools, the components, the finished parts with and from which millions upon millions of wanted products are formed.

This is the crossroads of American Industry . . . and here, Inland serves.

This is a territory teeming with life, with creative activity, with bright plans for the future. It spreads across the length and breadth of Indiana and Tennessee—takes in the explosively productive central and western areas of Ohio—and Kentucky. This is a territory that gives to the nation, great political leaders, famous writers, artists, poets, educators.

From this land and the hands of its people come the products of steel—the gleaming lathes, drill presses, grinders, machine tools, that make our country the bulwark of the Free World. Out of its factories come the steel truck and car bodies, the ignition systems, radios, headlights, horns, heaters, exhaust systems—countless components for the hungry automobile assembly lines. Here, builders and fabricators take steel—bend it, cut it, shape it into the forms, structurals, tanks, girders for the nation's building and construction industries.

Here, years ago, Indiana Harbor Works of Inland Steel Company shipped its first orders of steels, among them the products of its new continuous sheet mill, one of the first modern mills in America. Throughout the years, Inland continued to serve and in serving learned the needs of this amazingly diverse territory—adjusted its steelmaking to the practices of its manufacturers.

Today, Inland accepts as a major goal—ever expanding service to the builders and manufacturers of this constantly developing territory. Inland is here, and here to stay. For *here* . . . is Inland's future.

INLAND STEEL COMPANY

30 West Monroe Street — Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

Other Members of the Inland Family
Joseph T. Ryerson & Son, Inc.
Inland Steel Products Company
Inland Steel Container Company*
Inland Lime & Stone Company*
*Division

INLAND

66 years of service to the Industrial Middle West

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HERC-ALLOY
CHAIN ASSEMBLIES
without delay with...

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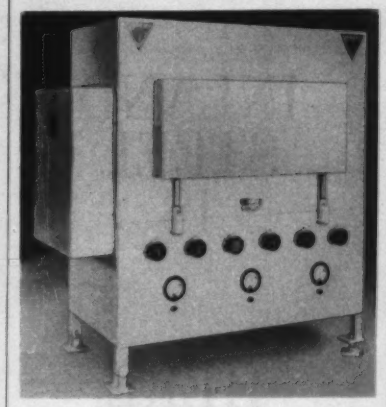
CM CHAIN

NEW PRODUCTS and equipment



(*Concluded from Page* 104)

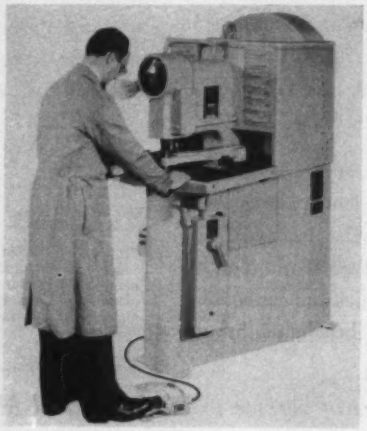
units) are perpendicular to the tube and are equally distributed over and under the tube. The unit is insulated with 9 in. of graded, superduty insulating bricks (lightweight type).

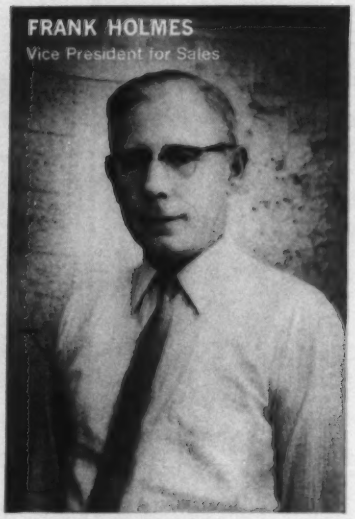
For further information, *write* Pereny Equipment Co. Inc., Chambers and Pereco Streets, Columbus 12, Ohio.

Unit Punches 3½ in. Holes In ¼ in. Mild Steel

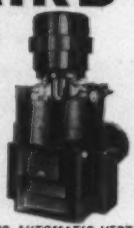
PUNCHING, notching, and nibbling for short and medium production runs and prototype work can be done with the Strippit Fabricator (Model 15A). The unit has a new, simplified Electro-Hydramatic head.

Round or shaped holes up to 3½ in. in diameter can be punched in any sheet material up to ¼ in. mild steel. Straight line or contour shear-





the special meaning of **BAIRD**



54VC AUTOMATIC VERTICAL CONTINUOUS LATHE

Here at Baird we build Automatic Multiple Spindle Chuckers, Transfer Presses, Vertical Lathes, Bench Power Presses, and Four-Slide machines. Just for the moment, let's sidestep the usual claims of quality, accuracy, precision, and performance. Let's look at the men in both large and small companies all over the country who are entrusted with the responsibility of deciding what automatic machinery to buy . . . whose to buy . . . and when to buy them.

Baird has a special meaning to these people for a very simple reason. They have come to rely, not only on the products of Baird, but on the Baird way of working with them. When their machines arrive, they are in top operating order, ready for production. No waiting for them to be "finished on the floor".

76H CHUCKER

When you are looking for an experienced and valid opinion on manufacturing a high production part . . . if you need firm, factual information in a hurry to prove your point . . . when you require a sound, sensible quotation to justify your requisition . . . you can count on Baird. And afterward, too . . . you will find the willingness to assist in installation and initial operation positively refreshing.

Why not give us a chance to prove our point? Send us your prints or sample parts, plus specifications. We'd like to hear from you.

Frank Holmes

Frank C. Holmes

BAIRD

THE BAIRD MACHINE COMPANY
1300 Stratford Avenue, Stratford, Conn.

new...
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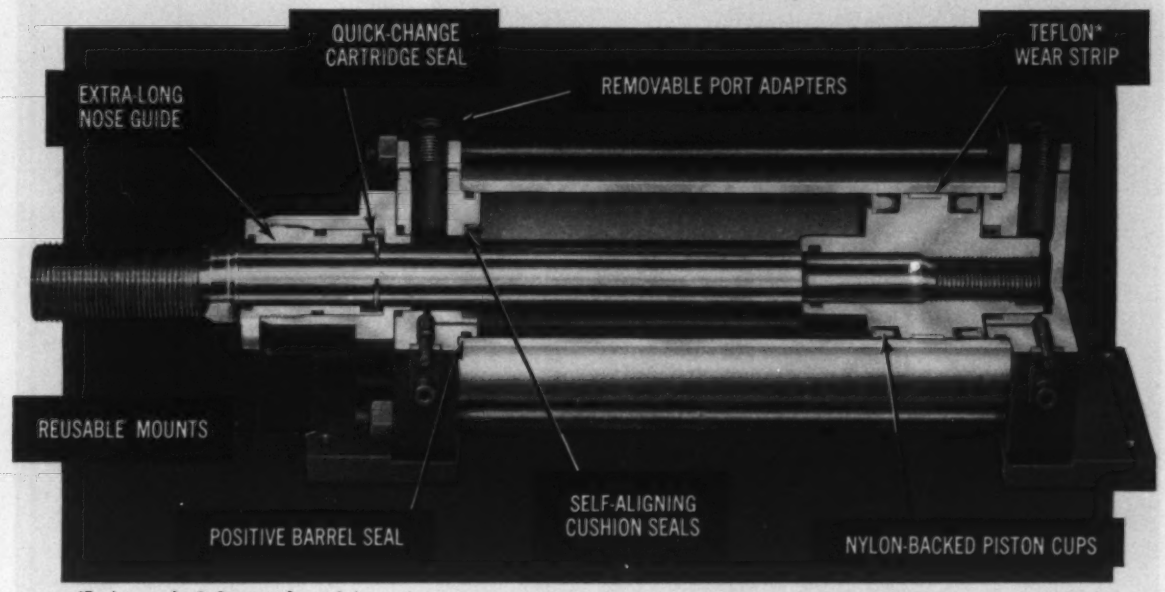
Valvair® HEAVY-DUTY AIR AND HYDRAULIC CYLINDERS

200 psi air, 500 psi hydraulic



*Trade name for DuPont tetrafluoroethylene resin

. . . will provide efficient, dependable service on your high-production equipment

A look inside shows you why Valvair heavy-duty cylinders belong on *your* high-production machines! Built by Valvair, makers of famous SPEED KING valves, these heavy-duty cylinders provide design, construction and component material features coordinated to assure efficient operation, longest service life and minimum downtime.

Whether you're ordering new machines, or modernizing equipment now in use, it'll pay you to specify Valvair heavy-duty cylinders for all your high-production machines. A full range of bore and rod sizes, interchangeable *and reusable* mountings, stroke lengths and cushioning options are available.

Call in your nearby Valvair or Bellows field engineer today . . . take advantage of one-source responsibility for all your control system needs . . . cylinders, valves, manifolds, filters, regulators and lubricators.

8038-1

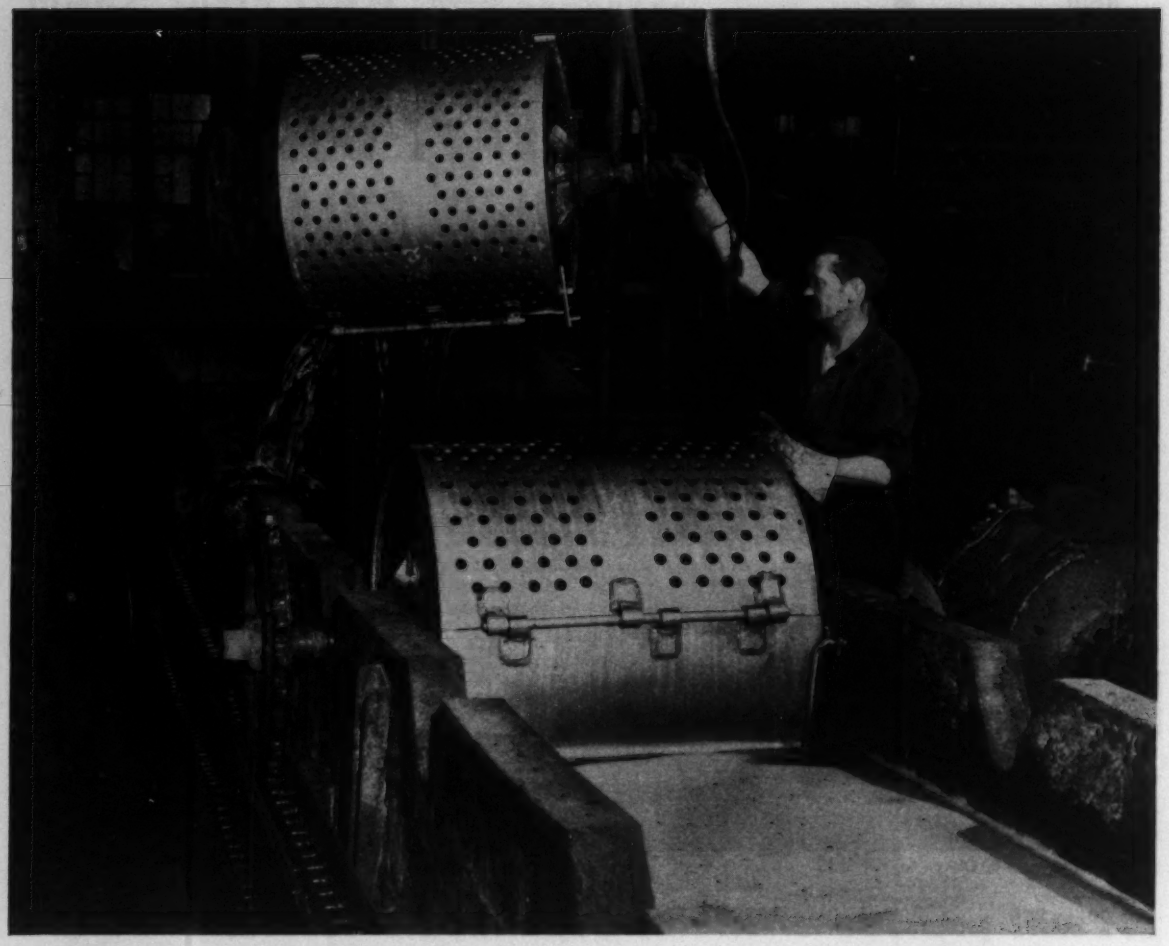
For detailed information, write for Bulletin VC-800. Address Dept. ST-360 Valvair Corporation, Akron 11, Ohio

Valvair AKRON 11, OHIO

DIVISION OF INTERNATIONAL BASIC ECONOMY CORPORATION (IBEC)

Other INDUSTRIAL DIVISIONS of IBEC: The Sinclair-Collins Valve Co. The Bellows Co., Akron, Ohio • V. D. Anderson Co., Cleveland, Ohio.

VALVAIR AIR & HYDRAULIC CYLINDERS • SPEED KING CONTROL VALVES AND MANIFOLDS • PLUG-IN CONTROL VALVES AND MANIFOLDS
HI-SPEED INLINE VALVES • PILOT VALVES • MINI-KING VALVES • MANUAL VALVES • FILTERS • REGULATORS • LUBRICATORS



12 years in continuous pickling service Monel barrels still trouble-free

When you examine them, it's hard to realize that these barrels have endured twelve hard years of automatic pickling.

Look at the tell-tale points . . . edges, hinge pins, welds, axle. Note the severe pickling cycle . . . a mixture of 10% sulfuric and 2% hydrofluoric acid, rinse, 20° Baume zinc ammonium chloride at 180° F, dry.

You can see that these barrels are good for many more years of trouble-free service.

Isn't that what you would expect from Monel* nickel-copper alloy?

Malleable Iron Fittings do! That's why they specify Monel alloy for their pickling barrels and for all the really tough pickling jobs.

Tank tie-rods are Monel alloy, too This company takes full advantage of the high strength and superior resistance to corrosion of Monel alloy to keep its wooden acid tanks tight, too . . . using the metal for tie-rods and fittings. In other plants Monel alloy is used as well for baskets, hooks, chains — all kinds of pickling fixtures and equipment. In sulfuric acid pickling service no commercially practical, easy-to-fabricate alloy gives longer service life than Monel alloy.

In pickling, Monel alloy is a real money-saver! Long life and greater payloads add up to give you the economical service you need. Get full information on how Monel alloy can cut *your* costs. Write for our booklet, "Equipping the Pickle House for Greater Production at Lower Cost."

*Inco trademark

HUNTINGTON ALLOY PRODUCTS DIVISION
The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

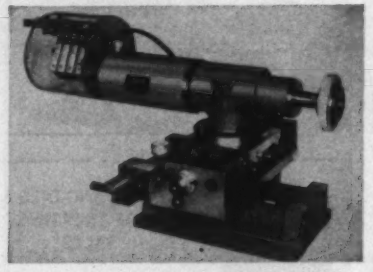
MONEL®

ing can be done at 165 strokes per minute in ⅛ in. mild steel. A toggle switch changes the unit from single stroke punching to nibbling at 165 strokes per minute. The model has multiple stop, side, and back gaging.

For further information, *write* Wales-Strippit Inc., a unit of Houdaille Industries Inc., 210 S. Buell Rd., Akron, N. Y.

Precision Spindle Does Electrolytic Grinding

THE Anocut electrolytic grinding spindle operates at 1000 amperes. It uses a 2 hp, 3600 rpm motor and is mounted on a Pope heavy duty universal slide.



Large dial indicators attached to the slide measure work feed in ten thousandths of an inch. Total eccentricity of Pope precision spindle shafts is less than 0.00005 in.

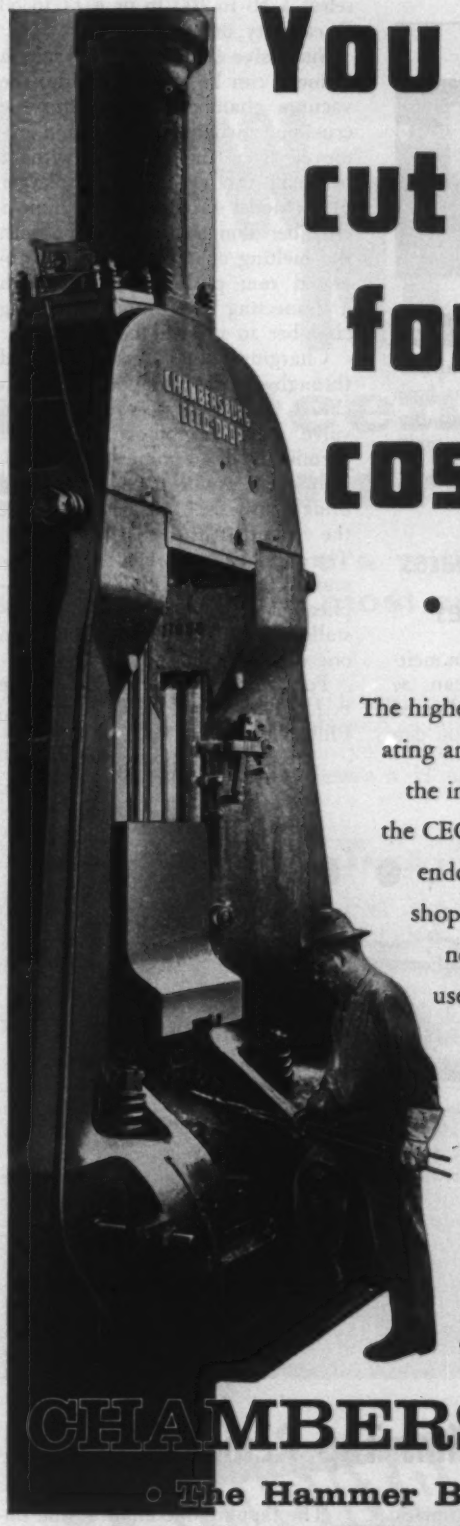
For further information, *write* Pope Machinery Corp., 261 River St., Haverhill, Mass.

Graphite Tube Furnaces Can Hold Heat at 5000° F

A LINE of graphite tube furnaces has been expanded and modernized to meet a wider variety of high temperature research and production requirements.

You can get 17 basic Harper models with heated lengths from 12 to 60 in. and tube ID from 1 to 6 in. Design permits maintaining continuous temperatures up to 5000° F. Work heating takes place within a tubular graphite resistance element.

Basic models include a short en-



You can cut your forging costs in • 1960

The higher production, lower operating and maintenance costs, and the improved safety features of the CECO-DROP account for its endorsement by leading forge shops all over the world. Why not join the more than 130 users who are being "thrifty in '60" and install Ceco-Drops in *your* shop.

Send for the 28-page bulletin, "The Ceco-Drop and its place in Forge Shop Modernization." Write today.

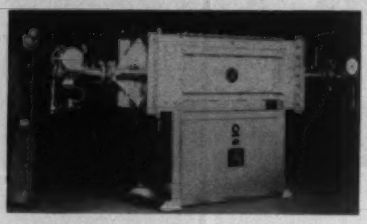
•

CHAMBERSBURG ENGINEERING CO.
Chambersburg, Penna.

CHAMBERSBURG
• The Hammer Builders •
DESIGNERS AND MANUFACTURERS OF THE IMPACTER

When it's a vital part, design it to be FORGED

NEW PRODUCTS and equipment



closed entrance chamber, heating chamber, and a water cooled chamber for cooling in controlled atmospheres. Doors are provided at both ends. Purge chambers are available.

For further information, *write* Harper Electric Furnace Corp., 110 Pearl St., Buffalo 2, N. Y.

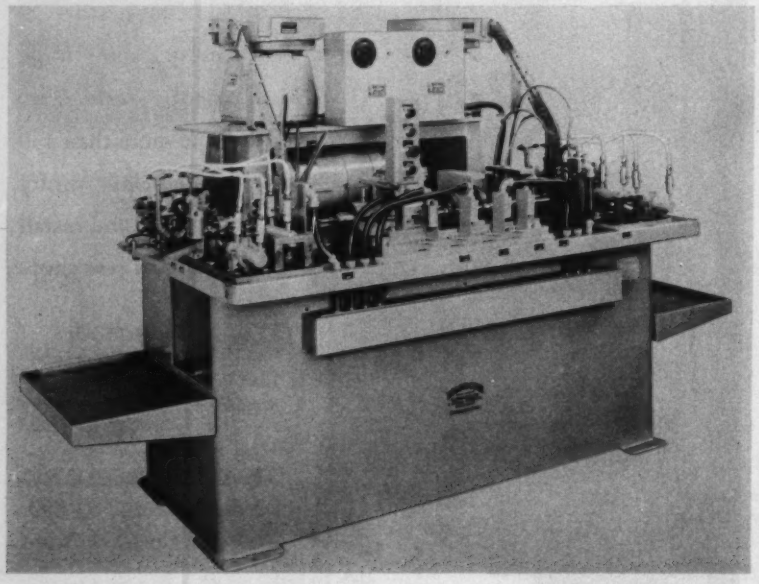
Vacuum Melting Furnaces Packaged in Two Sizes

SEMICONTINUOUS vacuum melting and precision casting can be done in the Stokes induction heated vacuum melting furnaces. You can select a 50 to 100 lb or a 17 to 50 lb capacity unit.

Successive charges (to be vacuum refined) can be introduced into the vacuum chamber, loaded into the crucible, melted, poured, and removed from the chamber without breaking the vacuum. The larger unit (Model 437-523) has the mold chamber alongside and in line with the melting chamber. A power operated ram pushes molds through a connecting door into the melting chamber to receive the pour.

Charging stock is introduced through a separate port which is closed by an air operated vacuum valve. A port on top of the chamber permits use of an immersion thermocouple, a sampling bucket, or a bridge breaker without breaking the vacuum in the melting chamber. The smaller unit has similar operating features. Either unit is supplied as a package. It can be installed and placed in operation in one day.

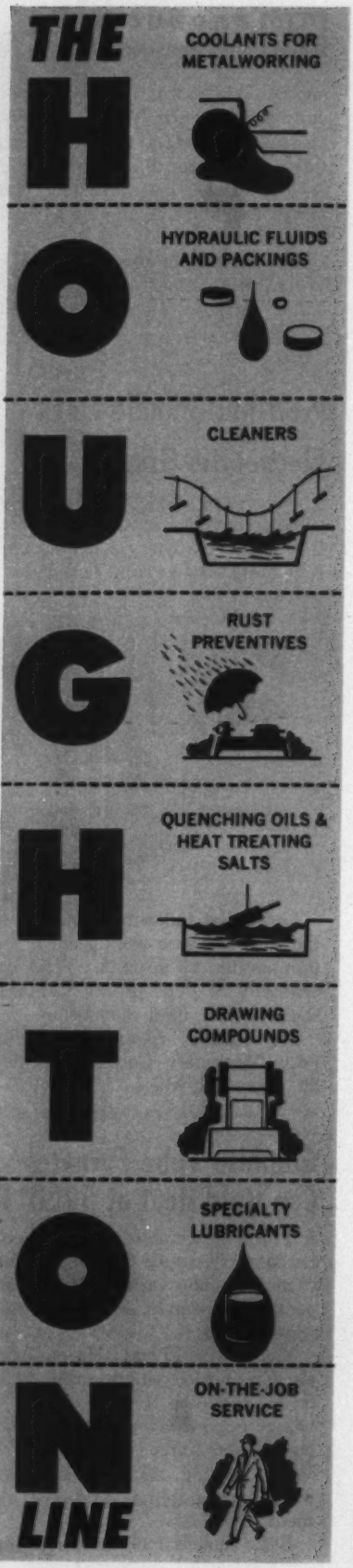
For further information, *write* F. J. Stokes Corp., 5500 Tabor Rd., Philadelphia 20, Pa.



Tapping Unit Trims Tap Removal Time

HERE'S A continuous, automatic tapping machine that uses a double ended lead screw spindle and a hi-reversal motor drive to cut loss of production time in tap withdrawal.

The tapping operation at one station takes place at the same time as withdrawal at the opposite station. The basic unit is designed for vibrating type feeders (on a shelf



NEW NEW NEW NEW

Cerfa-Kleen Metal Cleaners

FOUR NEW, more efficient cleaners with all the EXTRAS you asked for to handle most any metal cleaning job!

Each of Houghton's new and different Cerfa-Kleens is job-tailored to (1) clean faster and more efficiently (2) to be easier and safer to use and (3) to give you EXTRA benefits such as built-in rust preventives, water softeners, non-foaming and free-rinsing characteristics when you want them. Best yet, you don't have to pay a high price for special formulations when there's a Houghton Cerfa-Kleen to handle most any cleaning job.

IN POWER WASHERS

(1) Cerfa-Kleen *HPW* (Hot Power Washer)

A powerful new, heavy-duty cleaner with a built-in rust preventive. Non-foaming, non-caking, free-flowing, with no free caustic.

(2) Cerfa-Kleen *CPW* (Cold Power Washer)

A special formulation of fast-dissolving mild alkalies that work at room temperature and save heating costs. Also features a built-in water softener and rust preventive. Non-foaming, non-caking, non-dusting, free-flowing, with no free caustic.

IN SOAK TANKS

(3) Cerfa-Kleen *HST* (Hot Soak Tank)

To meet demand for more effective, faster immersion cleaning, even in hard water. Features hi-detergency far above that of ordinary cleaners. Non-caking, non-dusting, free-flowing, with no free caustic.

(4) Cerfa-Kleen *CST* (Cold Soak Tank)

A versatile, highly concentrated liquid cleaner that replaces flammable and toxic solvents. Works effectively at room temperatures and saves heating costs. No free caustic. Also effective for "wipe-off", tumbling and other mechanical cleaning.

For details about Houghton's new Cerfa-Kleens or our full range of industrial metal cleaners, call your Houghton Man today, or write: E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

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HOW TO BEAT THE HEAT

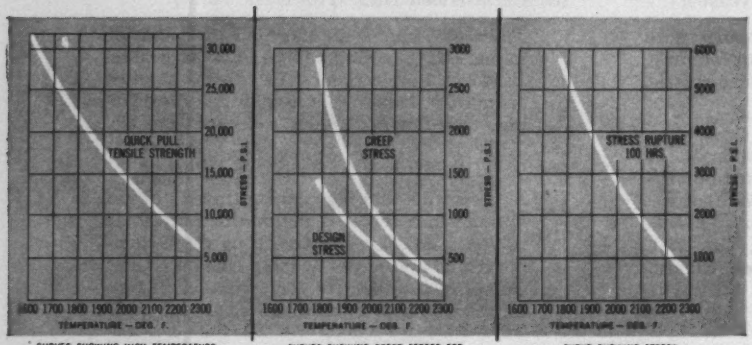
for strong high alloy requirements in the 1,800° to 2,300° F range!

DURALOY HOM*

*Covered by U.S. Patents

casting alloy

Duraloy "HOM" is a special high nickel alloy developed to produce castings that meet high temperature requirements, especially when castings are subject to oxidizing atmospheres.



CURVES SHOWING HIGH TEMPERATURE SHORT-TIME TENSILE STRENGTH OF DURALOY-HOM

CURVES SHOWING CREEP STRESS FOR CREEP RATE OF 1% IN 10,000 HOURS AND RECOMMENDED DESIGN STRESS FOR DURALOY-HOM

CURVE SHOWING STRESS TO RUPTURE AT 100 HOURS FOR DURALOY-HOM

Castings of DURALOY "HOM" are now being produced by our three methods: static, centrifugal and shell molded. Write today for additional information on this versatile new alloy.

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

NEW PRODUCTS and equipment

above the spindle). Other feeding arrangements may be used. Taps up to 1¼ in. in diameter can be handled. Multiple heads can be mounted.

A welded base contains the electrical controls, coolant pump, reservoir, and chip and work receptacles. The spindle is centrally mounted on the worktable, with tooling areas at each end.

For further information, *write* Bodine Corp., 315 Mountain Grove St., Bridgeport 5, Conn.

Airless Spraying Systems Can Supply Two Paint Guns

AIRLESS spraying systems that take paint from the original container through a Pacer 300 pump are available. The pump delivers working pressures up to 3000 psi and can supply two spray guns.

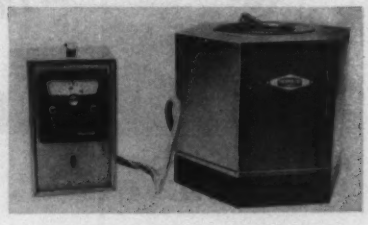
Nylon pressure fluid hose and re-usable hose fittings are provided. Stainless steel hose is optional. The Model 39 spray gun is a heavy production unit equipped with a tungsten carbide tip. Each system comes with pump, agitator, elevator, fluid manifold, strainer, and spray gun. Material containers are not pressurized.

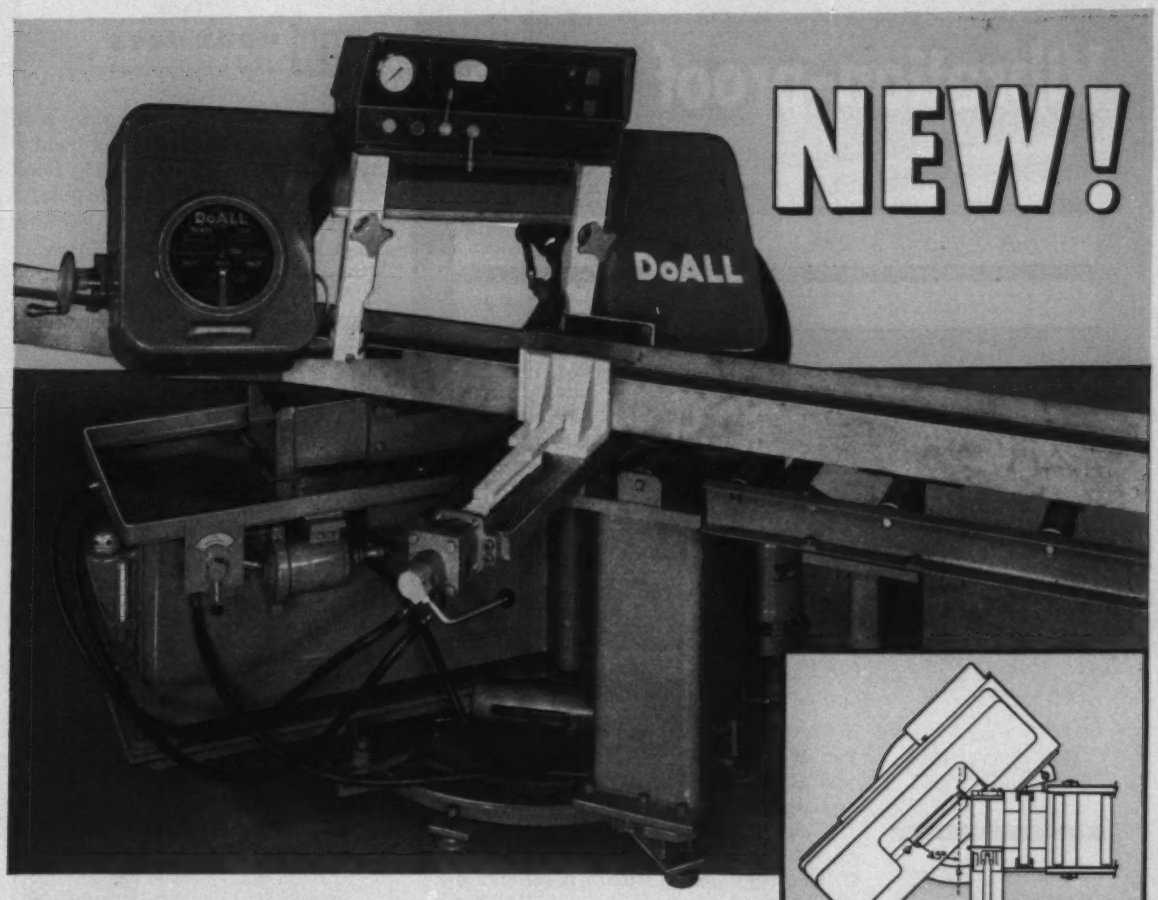
For further information, *write* Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.

Furnace Accessories Increase Versatility

ACCESSORIES developed for the Type 2100 Thermolyne furnace make the unit more adaptable and versatile as a salt bath, oil bath, melting, vertical muffle, or crucible furnace.

The accessories include two special alloy stainless steel pots (with





ANGLE-CUTTING POWER SAW

offers faster, easier operation

With the flick of a lever you can set the new DoALL C-167A power saw for any angular cut up to 45 deg. It's quick, simple, effortless. And it takes only seconds to change back to straight cut-off work or other angles. There are no swivel vises to reset . . . no problem of swinging or loading long stock. The stock table remains fixed—only the sawing head rotates.

The sawing unit is mounted on a turntable powered from the machine's hydraulic system. Angle degree graduations on the protractor base are large, easy to read. During the cutting cycle, a positive lock holds accurate position.

The new DoALL Model C-167A power saw brings new efficiency to warehouses and production shops. Capacity at 45 deg. is 9-in. rounds, or 10-in. channels or I-beams. Also available is Model C-168A, with an automatic indexing vise which advances stock between cuts. For complete data, call your local DoALL store or write for literature.

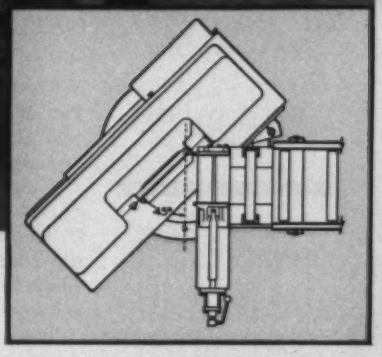
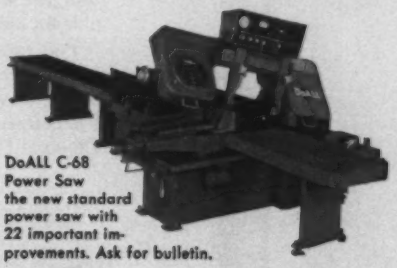


Photo shows DoALL C-167A angle power saw cutting end of 10-in. I-beam to 45-deg. angle. Sketch above shows plan view of C-167A angle power saw. Note how stock table and holding vise remain stationary while cutting head is mounted on turntable that pivots to any angle up to 45 deg. Fixed vise requires no adjustment regardless of angle being cut.



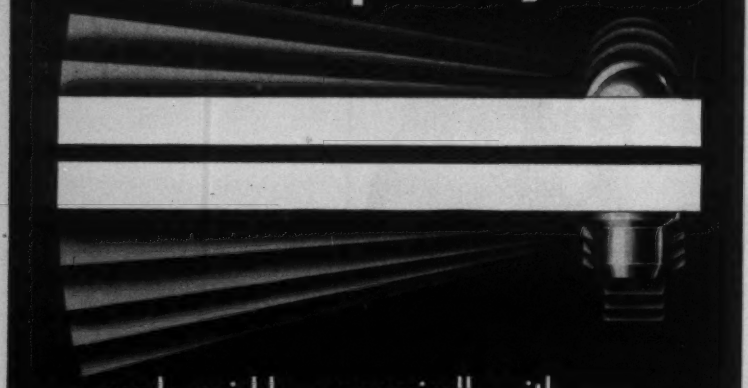
DoALL C-68 Power Saw the new standard power saw with 22 important improvements. Ask for bulletin.

PS-14

THIS IS A TYPICAL DoALL STORE

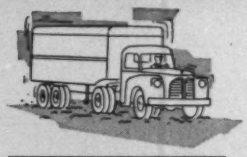
The DoALL Company, Des Plaines, Illinois

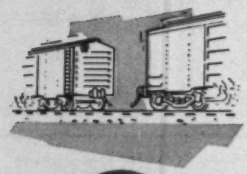
Vibration-proof joints

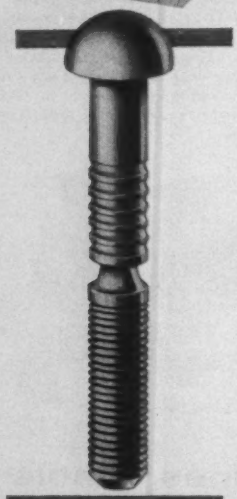


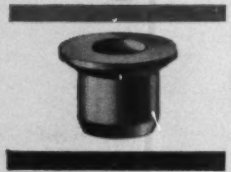
now made quickly, economically with new

TOWNSEND VERSA-LOCKBOLT









With the new Townsend Versa-Lockbolt* you get the same high tensile values as with the standard type but they cost less and are easier to install.

Wider grip ranges in a given size are provided by additional locking grooves. Other design changes make it feasible to use them in relatively oversized holes. Inspection time is reduced since hole size is less critical.

These features make for flexibility of design—make calculations simpler and more accurate.

Versa-Lockbolt installation is fast and guns provide uniform draw down or clinch —locking the collar with up to five tons of pressure. The new collar with its flanged integral washer makes it especially suitable for fastening even light gage materials.

For more information on how to get new vibration-proof fastening economy, write Townsend Company, Engineered Fasteners Division, P. O. Box 71-C, Ellwood City, Pa.

*Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307 2,531,048; 2,531,049 and 2,754,703

Townsend Company

ESTABLISHED 1916

Engineered Fasteners Division

ELLWOOD CITY · PENNSYLVANIA

Chicago Area Division · Santa Ana, California

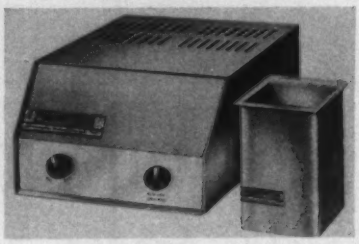
NEW PRODUCTS and equipment

covers) for liquid heating to 1000 and 1600° F; a safety lifting handle; a perforated, stainless steel, small parts basket with lifting handle; a perforated, stainless steel skimmer for removing sludge or crust; a graphite melting ladle for use to 1700° F with a nonslip lifting handle; a refractory chamber liner, and a refractory chamber cover.

For further information, *write* Thermo Electric Mfg. Co., 495 Huff St., Dubuque, Iowa.

Ultrasonic Cleaner Has ½ Gallon Capacity

MORE than 50 distinct classes of soils and contaminants can be removed (in seconds) with the System Forty ultrasonic cleaner. Model G-40C1 has a 40 watt generator with an output of 90,000 cps. The cabinet measures 10 x 8 x 5¾ in. A push-pull control knob is used.



Cleaning tank capacity is ½ gallon. The tank is constructed of deep drawn, heavy gage stainless steel with a 4A grade, high polish.

For further information, *write* Ultrasonic Industries Inc., 141 Albertson Ave., Albertson, N. Y.

Centralized Grease Unit Is Fed, Operated by Gun

A CENTRALIZED grease system made by Trabon is gun operated and can be used on small machines and other places where a manual or automatic pump cannot be installed.

Up to 16 points can be lubricated from a single gun fitting. Lubrication is complete when an indicator cycles properly. A blocked line or bearing freezes the indicator and gives a central warning signal. You

It's a small but important part of TMW's electronic punched card scheduling and control system. And it's your assurance that sub-contract jobs, regardless of size or quantity, are delivered *on time*.

You get this when you work with one of the world's largest, most modern and completely integrated manufacturers, whose 65 years' experience in precision (tolerance to 10ths) manufacturing is available to you *now* on either a short or long term basis.

Textile Machine facilities include 1200 modern machine tools of all types and sizes, a completely mechanized foundry (one of the country's largest), 3000 skilled craftsmen, plus a corps of the industry's top designers and engineers.

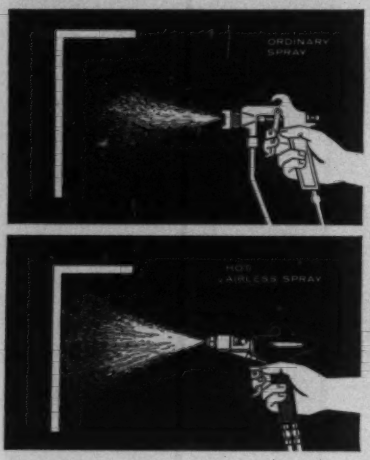
Combine these facilities with modern electronic production scheduling controls and quality control techniques . . . and you've got the perfect answer to all your sub-contract problems.

Write today for more detailed information, or for a copy of our latest Facilities File Folder.

TEXTILE MACHINE WORKS

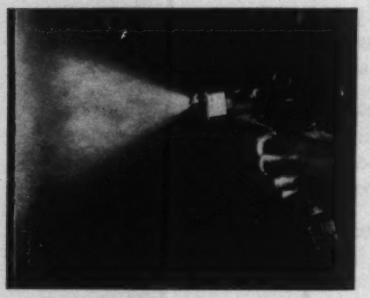
Contract Division • Reading, Pennsylvania

where there is paint fog... there is paint waste!



Whenever you see paint fog you see paint waste. Waste that can cost **you** thousands of dollars.

Nordson, and only Nordson, overcomes this problem of paint waste with a system that employs **both** heat and pressure — a system that provides maximum control over both cost and quality. With the Nordson Hot Airless System, savings of 30% on coating materials are common. Improved finishes and labor savings, too.



Sound too good to be true? Let us prove our story in your plant spraying your product with your coating material. Write for full information.

NORDSON CORPORATION
102 Jackson St., Amherst, Ohio

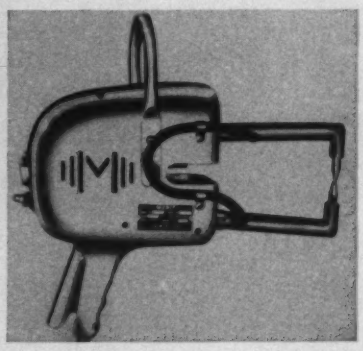
NEW PRODUCTS and equipment

can order a small strainer block with a removable screen to prevent grit and dirt from reaching the bearings.

For further information, *write* Trabon Engineering Corp., 28815 Aurora Ave., Solon, Ohio.

Portable Spotwelder Is Water Cooled

YOU can weld up to a combined thickness of 3/16 in. on production runs with the Model 155 portable spotwelder. Tip pressure can be varied up to 1000 lb. The unit draws 60 amperes at 240 volts. Output is over 10 kva.



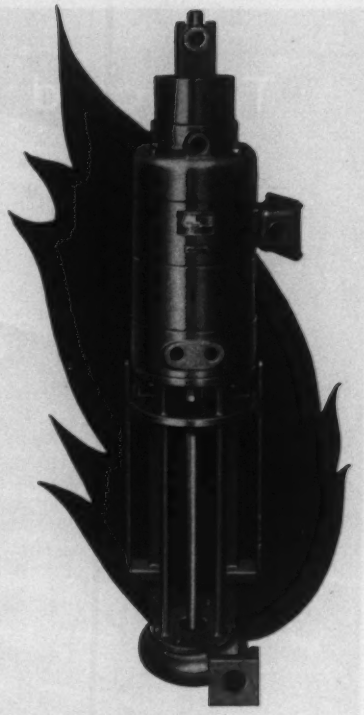
The welder is water cooled and has a throat depth of 11 in. It can produce uniform welds on materials including mild and stainless steel, aluminum alloys, brass, and cadmium or zinc coated steel. Special arms can be supplied.

For further information, *write* Spot Welder Div., Merit Co., 2124 W. Chicago Ave., Chicago 22, Ill.

Resistance Buttwelder Splices Wire in Seconds

A RESISTANCE buttwelder for continuous wire feeding eliminates loss of time from reel changing and wire threading in submerged arcwelding and in other operations using coil fed wire.

The unit splices wire diameters from 5/64 to 7/32 in. in 1 to 6 seconds. To make joints in wire, the operator places the wire ends in tongs and starts the welder. Current is automatically applied,



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Gusher Molten Metal Pumps are tested under operating conditions and have proved that they will give efficient performance under recommended temperatures and conditions of operation. Models 15028E and 15028XE are suitable for temperatures up to 1000° F. Model 9075M with or without closed water jacket for temperatures up to 750° F. Other models from ¼ HP to 10 HP. Write for information and illustrated folder.

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MACHINERY CO.

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the joint is upset, and the welder shuts off automatically at the end of the timed cycle. Flash cutter pliers (an accessory) remove excess metal at the joint. The unit (with transformer, tongs, and cable) weighs 35 lb. Several areas can be serviced with one welder.

For further information, *write* Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio.

40 lb Arcwelder Has 20 to 95 Ampere Range

YOU CAN weld metal up to ¼ in. easily and with good penetration with the M&T Murex arcwelder. Electrodes from 1/16 to 1/8 in. can be handled. With an auxiliary arc torch, the unit can be used for brazing, soldering, heating, and bending on all ferrous and nonferrous metals.

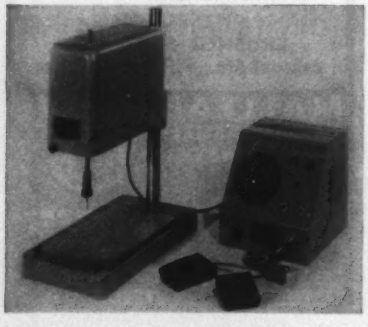
Weight is 40 lb. The transformer uses double glass insulation on both primary and secondary windings, and operates from 110 or 220 volts ac. Welding current range is 20 to 95 amperes.

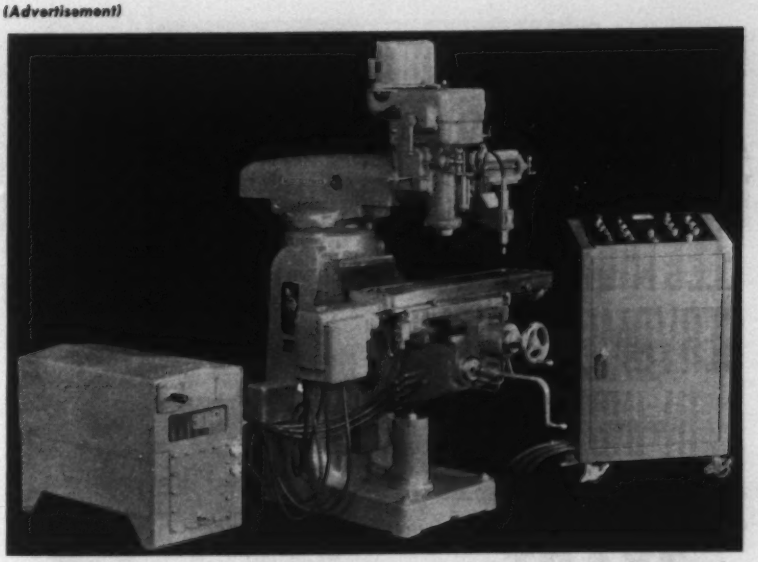
For further information, *write* Metal & Thermit Corp., Rahway, N. J.

Precision Tapping Unit Makes Quick Pitch Change

UNSKILLED operators can do accurate small hole tapping on the Milman tapping machine. It's recommended for through or blind hole tapping in workable materials.

The machine feeds and withdraws the tap from the workpiece at a rate controlled by a single master lead screw. The unit can be set to tap any standard pitch from 32 to 120 threads per inch in sizes 000 through





Shown above is the new, Gorton Auto-Trace, with fully automatic and integrated electronic-hydraulic tracing and mach¹ning, for fast, high-accuracy duplicating and profiling.

Many Benefits of Numerical Control Machining now Obtainable at Much Lower Cost with Automated Electro-Hydraulic Duplicating

Although automated machining by numerical control is sensational in performance and cost savings on certain types of work, it has certain limitations. The initial cost of such equipment has tended to deprive many manufacturers of its benefits. This is particularly true if manufacture involves such parts as intricate or complex shapes. For this kind of machining manually operated equipment has continued to be popular. Manually operated machining, especially of complicated parts can, however, be done only at a cost per piece much higher than numerical control. Skilled operators are required to obtain the close tolerances demanded today. Rejects and scrap costs are high. The slow feed rates restrict output. A real need has existed, therefore, for automation which would fill the gap between numerical and manual control of machining.

Into this situation has come a new, fully automated machine. It is a remarkable combination of automatic electronic tracing, with automatic hydraulic power. This combination permits maintenance of the most critical tolerances at feed rates previously thought impossible. No skilled operators are needed. Human error is eliminated, and so are rejects and scrap. Maintenance is negligible. Output and low production costs compare favorably with the best results of punched or magnetic tape automation.

The new machine is the Gorton 180° Auto-Trace. It is a fully automatic electro-hydraulic duplicator and profiler. Developed by George Gorton Machine Company of Racine, Wisconsin, pioneer in automation, the Auto-Trace was fully tested in the field before its announcement. In actual installations it has demonstrated almost incredible cost savings, accuracy and speed over a wide range of difficult work. Specially designed for 3-dimensional scanning and machining, it has already made outstanding contributions in the field of dies and molds and pattern making. It machines automatically, to critical tolerances, the most intricate convex and concave shapes, deep serpentine grooves, steep angles and contours. The Auto-Trace is now available for the general market. Full information may be obtained on letterhead request to George Gorton Machine Company, 2003 Racine Street, Racine, Wisconsin.

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NEW PRODUCTS and equipment

No. 10. Pitch changeover takes less than 2 minutes. Torque delivery to the tap can be changed by adjusting the friction clutch.

An automatic or semiautomatic tapping cycle can be preset for speed and length of stroke. The cycle is controlled by foot switches.

For further information, *write* Milman Engineering Co., 1831 Pontius Ave., Los Angeles 25, Calif.

Differential Valve Divides Flow Six Ways

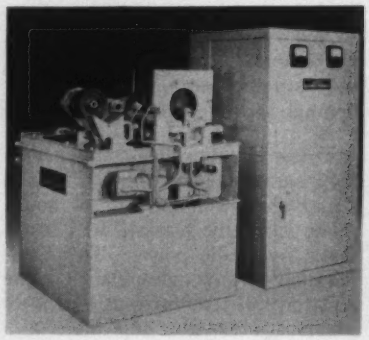
A DIFFERENTIAL pressure manifold valve having only one moving part can be actuated by air, gas, or fluids. Different materials can be used on the control and working sides.

It's available in such materials as aluminum, brass, nylon, Teflon, and stainless steel. Port sizes range from $\frac{1}{8}$ to $\frac{1}{2}$ NPT on control and working sides. The unit can divide the flow of fluid two to six ways, or it can be used to mix two or more fluids that must leave through a common exit.

For further information, *write* Frankel Engineering Laboratories Inc., 207 S. Fifth St., Reading, Pa.

Induction Heating Unit Has Automatic Indexing

PARTS such as rollers and wheels (from 6 to 14 in. in diameter) can be heat treated with a semiautomatic, low frequency induction heater developed by Ajax Magnethermic Corp. As a power source,



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TRU-STEEL HIGH CARBON STEEL SHOT

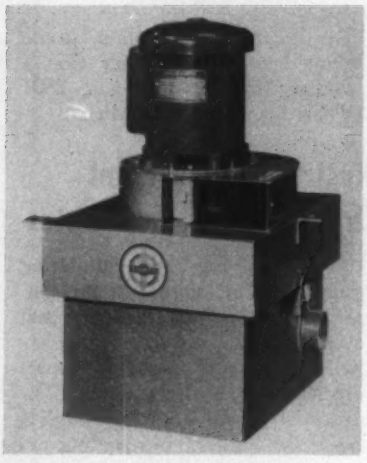
you can use direct line 60 cycle or a Multiductor 180 cycle static frequency converter.

The heater has automatic indexing. Quenching of one part while another is heating provides continuous production. Practically no scale or decarburization is produced. Residual stresses are minimized without danger of hardening the bore or other hub sections prior to machining.

For further information, *write* Ajax Magnethermic Corp., 3990 Simon Ave., Youngstown, Ohio.

Industrial Dust Collector Uses Throwaway Filters

A THROWAWAY glass filter is used in the Torit industrial dust collector, suitable for light dust producing operations. The unit (Model



301) stands 21½ in. high with floor space requirements of 12 x 14 in. It's equipped with a 1/3 hp motor.

For further information, *write* Torit Mfg. Co., 1133 Rankin St., St. Paul, Minn.

Elevating Feeders Can Be Controlled Automatically

A VARIETY of part sizes, shapes, and materials can be fed and oriented with the DPS elevating feeder. The unit can discharge to the right or left at desired heights. Fixed or variable speed drives can be used.

Automatic controls can be added to operate the feeder only when parts are needed. You can select from standard sizes of 6, 12, or 20

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SILVER PLATTER SAVINGS

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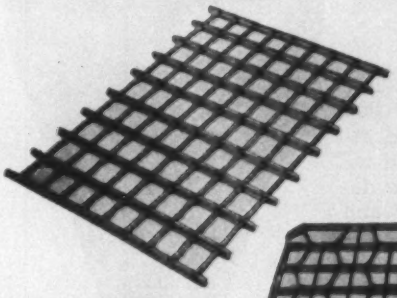
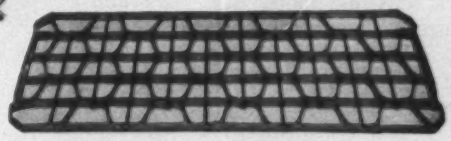
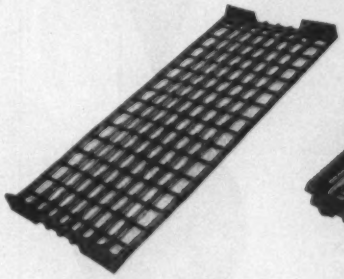


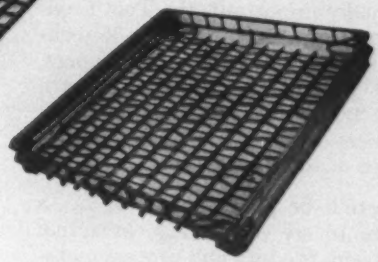
"Pressure Welded" Furnished 2-layer or 3-layer



"Serpentine"



"Pressure Welded" with pusher pads



"Serpentine" with load-retaining sides

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These worthwhile savings have resulted from Rolock's engineering approach to tray design, taking into consideration details of the furnace hearth, tray load and weight ratios, method of operation, temperature limits and gradients and many other factors.

Complementing correct design, Rolock's unique "Serpentine" and "Pressure-Welded" construction features have proved to be, in many installations, the answer to problems of rapid tray deterioration. That is why Rolock today is a major supplier of furnace trays of these and many special types.

Why not make your own test. Let Rolock design and build your next replacements.

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cu ft capacity. Other sizes can be fabricated to meet special requirements.

For further information, *write* Detroit Power Screwdriver Co., a subsidiary of Link-Belt Co., 2801 W. Fort St., Detroit 16, Mich.

Rust Inhibiting Paint Dries Hard in 15 Minutes

A FAST drying, rust inhibiting primer, Jet-Dri, stops rust on contact with a special pigment that reverses normal electrogalvanic action. It dries to a hard, impact resistant coat in 15 minutes. The primer is valuable for withstanding shocks and abrasion of handling and transport.

Maintenance painters on scaffolds can apply a rust preventive prime coat and follow with a finishing coat in minutes. The company says job tests show labor costs can be cut by one-third with this technique.

The resin base makes the primer resistant to acids, alkalies, salt spray, corrosive fumes, oil, and boiling water. It can be applied by brush, roller, spray, or by dipping. Laboratory tests show that follow up finishing paints are more easily applied to polished metal surfaces when preceded by a Jet-Dri prime coat. It bonds well to cold rolled, smooth and highly polished steel.

For further information, *write* Jet-Dri Div., Consolidated Chemical & Paint Mfg. Co. Inc., 456 Driggs Ave., New York, N. Y.

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STEEL is tension on the charging floor as molten iron begins to pour. It is a "heat" of 200 tons of fiery metal ladled into glowing ingot molds. From 41 Open Hearths of Youngstown comes the basic steel you need. High quality steel that is pierced, rolled, pressed and formed into tubular goods, sheet, bar, rod, tinplate and alloy steels. Steel for cars, for toys. For tractors, for pipelines. Steel from the expanding and integrated organization that marks Youngstown today as the growing force in steel.

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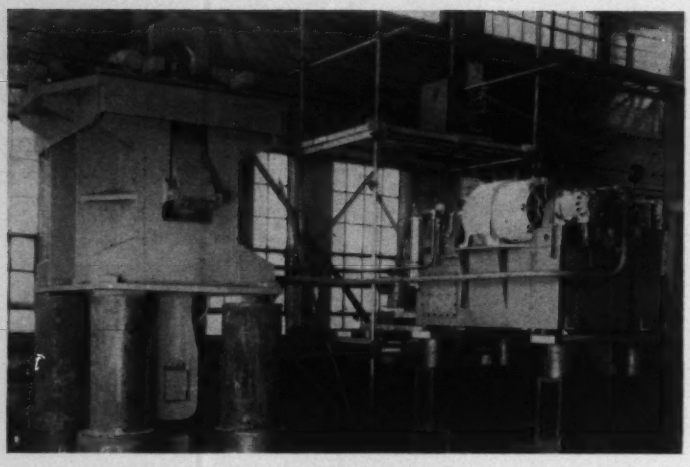
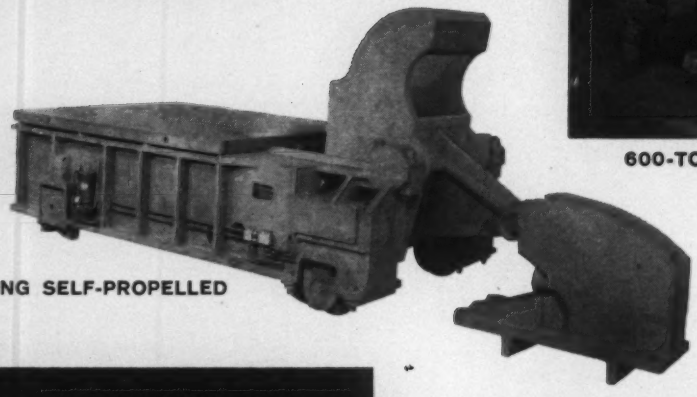


800-TON INGOT STRIPPER

600-TON INGOT STRIPPER



FORWARD-TILTING SELF-PROPELLED INGOT BUGGY

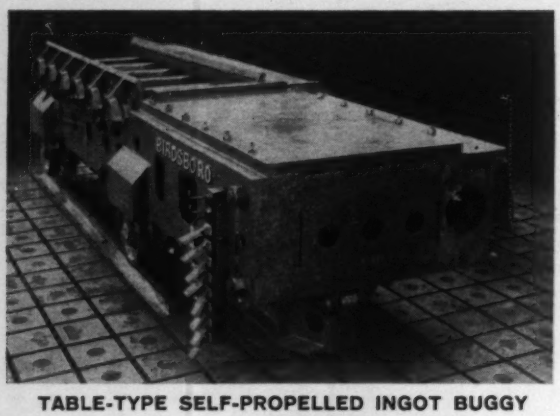
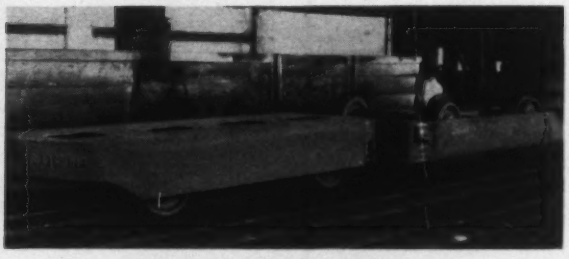
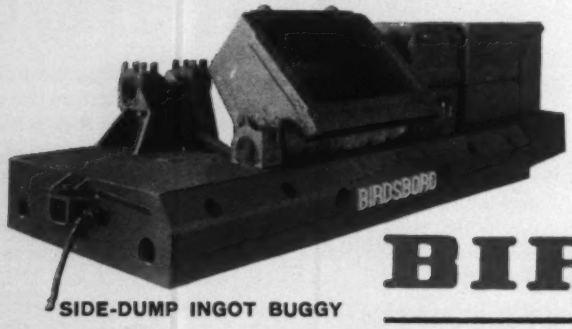


TABLE-TYPE SELF-PROPELLED INGOT BUGGY



INGOT TRANSFER CARS



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NEW literature

Write directly to the company for a copy

Standard Transmissions

An 8 page brochure describes heavy duty transmissions with input torque capacities of 150 to 2500 ft-lb. Cotta Transmission Co., Rockford, Ill.

Sealless Pumps

A high pressure line of sealless, leakproof pumps is described in a 4 page bulletin, 1070-1. Chempump Div., Fostoria Corp., P. O. Box 35-11, Huntingdon Valley, Pa.

Machining Steels

An 8 page bulletin gives engineering data on Ledloy 375 and 300 cold finished steel bars, and Ledloy 170 cold drawn steel tubing. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Profilometer

A bulletin shows a variety of Profilometer combinations for measuring the surface finish of almost any production surface. Micrometrical Mfg. Co., 345 S. Main St., Ann Arbor, Mich.

Fasteners

A brochure depicts a variety of assembly-cost saving case histories involving Speed Nut fasteners. Tinnerman Products Inc., P. O. Box 6688, Cleveland 1, Ohio.

Chain and Sprockets

A 56 page bulletin, A691, gives selection data and list prices of roller chain and taper-lock sprockets. Dodge Mfg. Corp., Mishawaka, Ind.

Small Tubing Data

A basic guide covers the selection and use of stainless steel tubing ranging from 33 gage hypodermic needle sizes to heavy wall, high pressure tubing up to ⅝ in. OD. Posen & Kline Tube Co. Inc., Box 549, Norristown, Pa.

Application Manual

A manual includes information concerning the uses for rubberized abrasives, case histories on a variety of typical applications, and a copy of the latest Cratex catalog. Cratex Mfg. Co. Inc., 1600 Rollins Rd., Burlingame, Calif.

Laminated Plastics

Two engineering bulletins provide basic information on Grades ARF-HT and G3-HT. They list all the sheet properties of each high temperature laminated plastic. Synthane Corp., Oaks, Pa.

Flexible Machining

A 34 page brochure covers flexible shafting, flexible shaft machines, handpieces, and accessories. Jarvis Corp., Middletown, Conn.

Tube Bulletin

This 28 page bulletin (February-March, 1960) lists carbon and stainless round, square, and rectangular tubing in stock. A. B. Murray Co. Inc., P. O. Box 476, Elizabeth B, N. J.

Protective Maintenance

A brochure describes protective maintenance coating systems and matches them with specific application problems. Glidden Co., 900 Union Commerce Bldg., Cleveland 14, Ohio.

Dimensional Air Gaging

A 50 page handbook describes how to select the right amplification for the gaging job, when to use long range air gages, the advantages and principles of air gaging inside and outside diameters and other geometrical conditions. Sheffield Corp., Dayton, Ohio.

Tap Selector

This selector lists stock taps available for all classes of thread fit and includes a section on price and gage information. Hanson-Whitney Co., Hartford, Conn.

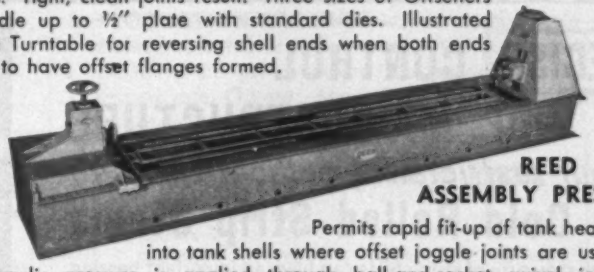
Resistance Welding Data

A wall chart contains data on resistance welding, standard and special tips. Also included: Seamwelding wheels, holders, rods, bars, and accessories. Ampco Metal Inc., Box 2004, Milwaukee 1, Wis.

WEBB TANK PRODUCTION MACHINERY

REED OFFSETTER

This machine forms an offset flange around shell ends to facilitate automatic welding of tank heads. It eliminates chill rings, decreases fit-up time, improves the concentricity of shell ends, and aids in reducing actual welding time. Tight, clean joints result. Three sizes of Offsetters handle up to ½" plate with standard dies. Illustrated with Turntable for reversing shell ends when both ends are to have offset flanges formed.



REED ASSEMBLY PRESS

Permits rapid fit-up of tank heads into tank shells where offset joggle joints are used. Hydraulic pressure is applied through ball-and-socket swivel joints that allow the head cups to set to the head. Hydraulically powered kick-outs speed up loading and unloading. Both headstock and tailstock are adjustable vertically; tailstock is also adjustable along the bed for various lengths of vessels up to 18'.

Fit-up rolls are also available to facilitate proper alignment and assembly of shells lacking rigidity.

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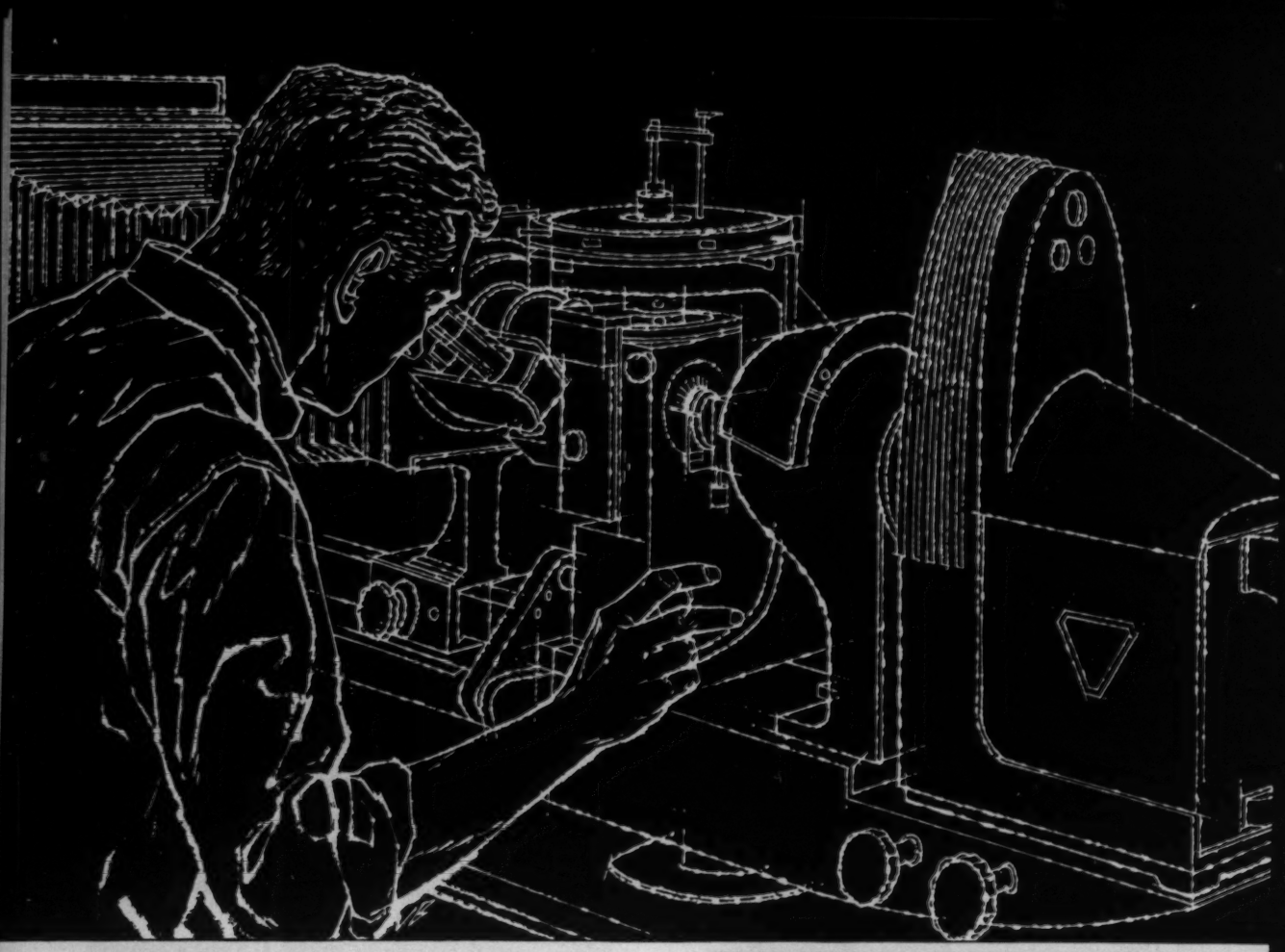

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Building Awards Bolster Market

BEST news of the week comes from structural fabricators who are greatly encouraged by renewed demand for their services. As good weather approaches, they're starting to book jobs at a faster rate. Inquiries are more numerous, and the trend is toward larger tonnages. Since the construction industry traditionally takes about 14 per cent of finished steel shipments, a seasonal upturn in that field will help materially to offset the automotive industry's slow start. The automakers account for about 19 per cent of the steel that is shipped each year.

CHRYSLER TRIMS OUTPUT— Although new car deliveries in mid-February were 10 per cent higher than in the corresponding period of 1959, they were nevertheless disappointing. Reason: They fell short of the pace that was set in the first third of the month, when sales were 16.7 per cent ahead of last year's. Some automakers blamed the weather, while others adopted a wait-and-see attitude. All were concerned about mounting dealer inventories, now in excess of 1 million and equivalent to a 54 day supply. Chrysler Corp. will trim its March production by 850 cars a day (from 5000 to 4150). The cutbacks will be mainly in the Plymouth, Chrysler, and Imperial lines. De Soto sales are steady. Dodge, aided greatly by the popularity of its low priced Dart, has already exceeded its total 1959 production run. Valiant output may be increased.

SMALL CAR'S BIG IMPACT— When U. S. automakers brought out their compact models, they figured that consumers would buy them in preference to the small imported cars. But foreign car sales have shown little decline, if any, and appear to be running at an annual rate of 500,000. Does this mean that Falcon, Corvair, and Valiant are being sold at the expense of Ford, Chevrolet, and Plymouth? If so, steelmakers have a problem: Three compacts use no more steel than two cars of regular size.

Through February, production of 1960 models has been about 2.6 million, of which 600,000, or 23 per cent, have been compacts. The Big Three have turned out about 357,000 small cars. If each required 1.2 tons of finished steel, the total was 428,000 tons. But if the compacts had been regular size, each would have required 1.8 tons, for a total of 643,000. So it might be said that introduction of the compacts has thus far cost the steel industry about 215,000 tons.

But that conclusion is suspect because: 1. Introduction of the low priced cars may have brought a lot of buyers into the market who couldn't otherwise have afforded new autos. 2. If the American compacts hadn't been put on the market, sales of imported autos might have gone far above last year's figures.

THE OUTLOOK BY QUARTERS— Here's a revised estimate of 1960 ingot production: In the first quarter, an average rate of 94 per cent, with output of 35 million tons. In the second quarter, 85 per cent, 31 million tons; third quarter, 70 per cent, 26 million; fourth quarter, 80 per cent, 30 million. For the year: An 82 per cent rate and record production of 122 million ingot tons. If construction demand is good, operations may not drop as low as 70 per cent in the third quarter.

Chances for an upturn in the fourth depend on success of the 1961 autos and realization of capital spending plans.

PRODUCTION DECLINES— Last week, steelmakers operated their furnaces at 93.1 per cent of capacity, 1.3 points below the previous week's revised rate. Output: About 2,654,000 ingot tons.

WHERE TO FIND MARKETS & PRICES

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*Current prices were published in the Feb. 29 issue and will appear in subsequent issues.

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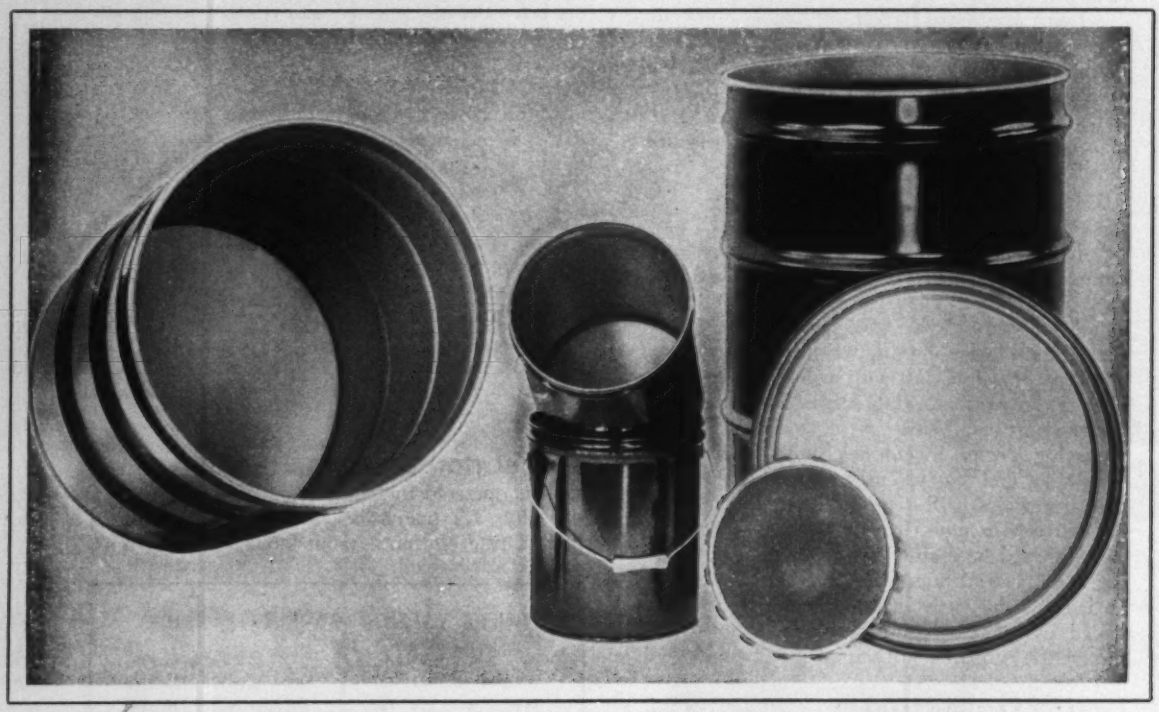

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***Canada: Dominion Rubber Company, Ltd.
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***Europe: Aluminium-Schweisswerk A. G.
Schlieren-Zurich, Switzerland***

AISI Compiles District Ingot Rates

A NEW SERIES of steel production statistics, consisting of weekly district ingot rates (per cent of capacity utilized), was introduced last week by the American Iron & Steel Institute.

The data, available for publication each Monday, will supplement the national ingot rate and index of steel production (based on average output in 1947-49) reported weekly by the institute.

• **Sets Up 11 Districts**—In the new series, the institute establishes 11 major geographic production districts (see table) replacing the 12 areas which STEEL set up over 30 years ago on which to base its production reports. The difference is explained by the institute's inclusion of Wheeling Area capacity in the Pittsburgh District.

The institute will collect data from 84 companies with 149 plants in 28 states and 122 communities, accounting for national steel ingot production capacity of 148,570,970 net tons as of Jan. 1, 1960.

The districts, in order of percentage of national ingot capacity, now rank: Pittsburgh, 21.5; Chicago, 19.9; Northeastern, 13.9; Youngstown, 10.4; Western, 6.4; Southern, 5.8; Cleveland, 5.5; Detroit, 5.4; Buffalo, 5.1; Cincinnati, 3.8; and St. Louis, 2.3.

• **Argument Settled**—During recent years, the question as to whether the Pittsburgh District or the Chicago District was the leading primary steel producing area has been strongly debated. Leadership depended upon the complex of separate producing points arbitrarily included in the general geographical areas.

The institute's alignment of production centers should settle the argument—it gives the advantage definitely to Pittsburgh with 31,870,890 net tons of ingot capacity vs. 29,567,900 for Chicago.

• **Will Project Estimates**—In light of the saturation coverage being made available by the institute, STEEL is discontinuing its own series in favor of the institute's. This is

American Iron & Steel Institute

1960 Steel Ingot Capacity (Net Tons) By 11 Major Geographic Districts

Location	Company	Capacity
NORTHEAST COAST DISTRICT		
Bridgeport, Conn.	Carpenter	84,000
Phillipsdale, R. I.	Washburn	93,000
Watervliet, N. Y.	Allegheny Lud.	76,300
Harrison, N. J.	Crucible	7,800
Roebling, N. J.	Colorado F. & I.	235,000
Philadelphia, Pa.	Midvale-Heppenstall	175,000
Philadelphia, Pa.	Pencoyd Steel	15,600
Coatesville, Pa.	Lukens	930,000
Phoenixville, Pa.	Phoenix	360,000
Ivy Rock, Pa.	Alan Wood	800,000
Fairless Hills, Pa.	U. S. Steel	2,687,000
Reading, Pa.	Carpenter	87,500
Bethlehem, Pa.	Bethlehem	3,900,000
Harrisburg, Pa.	Phoenix	486,760
Harrisburg, Pa.	Harrisburg	100,750
Steelton, Pa.	Bethlehem	1,500,000
Milton, Pa.	Merritt-Chapman	110,000
Burnham, Pa.	Baldwin-Lima	188,710
Sparrows Pt., Md.	Bethlehem	8,200,000
Baltimore, Md.	Armco	108,000
Baltimore, Md.	Eastern Stainless	72,960
Claymont, Del.	Colorado F. & I.	506,500
Totals 22 plants	17 companies	20,724,880
CINCINNATI DISTRICT		
Huntington, W. Va.	Porter	117,000
Cincinnati, Ohio	Amer. Compress.	21,600
Middletown, Ohio	Armco	2,700,000
Portsmouth, Ohio	Detroit Steel	1,000,000
Ashland, Ky.	Armco	1,038,000
Newport, Ky.	Acme-Newport	608,000
Owensboro, Ky.	Jessop Steel	183,190
Totals 7 plants	6 companies	5,667,790
PITTSBURGH DISTRICT		
Johnstown, Pa.	Bethlehem	2,400,000
Johnstown, Pa.	U. S. Steel	25,000
Washington, Pa.	Jessop	35,800
Donora, Pa.	U. S. Steel	1,015,000
Braeburn, Pa.	Braeburn Alloy	20,730
Latrobe, Pa.	Alco Products	108,650
Latrobe, Pa.	Latrobe Steel	24,000
Latrobe, Pa.	Vanadium-Alloys	12,000
Monessen, Pa.	Pittsburgh Steel	1,620,000
Aliquippa, Pa.	Jones & Laughlin	2,428,000
Aliquippa, Pa.	Porter	9,600
Ambridge, Pa.	A. M. Byers	90,000
Beaver Falls, Pa.	Babcock & Wilcox	321,730
Midland, Pa.	Crucible	1,364,000
Monaca, Pa.	Colonial Steel	30,000
Butler, Pa.	Armco	559,000
Duquesne, Pa.	U. S. Steel	1,741,000
Braddock, Pa.	U. S. Steel	2,529,000
McKeesport, Pa.	U. S. Steel	1,392,000
Munhall, Pa.	U. S. Steel	4,598,000
Clairton, Pa.	U. S. Steel	1,064,000
Brackenridge, Pa.	Allegheny Lud.	794,700
McKeesport, Pa.	Firth Sterling	20,040
Pittsburgh, Pa.	Jones & Laughlin	3,452,000
Pittsburgh, Pa.	Heppenstall	55,550
Bridgeville, Pa.	Univer.-Cyclops	77,410
Carnegie, Pa.	Union Electric	25,000
W. Homestead, Pa.	Mesta	105,000
Oakmont, Pa.	Edgewater	117,600
Weirton, W. Va.	National Steel	3,300,000
Steubenville, Ohio	Wheeling	2,400,000
Toronto, Ohio	L. Berkman	136,080
Totals 32 plants	24 companies	31,870,890
YOUNGSTOWN DISTRICT		
New Castle, Pa.	Mesta	66,000
Farrell, Pa.	Sharon Steel	1,370,000
Campbell, Ohio	Youngstown S.&T.	1,800,000
Youngstown, Ohio	Youngstown S.&T.	1,530,000
Youngstown, Ohio	Republic	2,129,000
Youngstown, Ohio	U. S. Steel	2,712,000
Lowellville, Ohio	Sharon Steel	593,000
Warren, Ohio	Copperweld	660,000
Warren, Ohio	Republic	1,520,000
Canton, Ohio	Timken	700,000
Canton, Ohio	Industrial Forge	79,200
Canton, Ohio	Republic	1,045,000
Massillon, Ohio	Republic	680,000
Mansfield, Ohio	Empire Steel	500,000
Totals 14 plants	9 companies	15,384,200
CLEVELAND DISTRICT		
Cleveland, Ohio	Jones & Laughlin	1,945,000
Cleveland, Ohio	Republic	3,490,000
Lorain, Ohio	U. S. Steel	2,678,000
Totals 3 plants	3 companies	8,113,000
DETROIT DISTRICT		
Dearborn, Mich.	Ford Motor	1,940,000
Ecorse, Mich.	National Steel	3,700,000
Ferndale, Mich.	Allegheny Lud.	4,000
Trenton, Mich.	McLouth	2,040,000
Warren, Mich.	Jones & Laughlin	300,000
Totals 5 plants	5 companies	7,984,000
CHICAGO DISTRICT		
Chicago, Ill.	Acme Steel	452,000
Chicago, Ill.	Finkl & Sons	33,600
Chicago, Ill.	Inter. Harvester	1,200,000
Chicago, Ill.	Republic	1,769,000
Chicago, Ill.	U. S. Steel	5,589,000
Chicago Hts., Ill.	Borg-Warner	117,500
Chicago Hts., Ill.	Columbia Tool	6,600
Lemont, Ill.	Ceco Steel	150,000
Morton Grove, Ill.	Harper	11,700
Sterling, Ill.	Northwest. S. & W.	825,000
E. Chicago, Ind.	Inland	6,500,000
E. Chicago, Ind.	Youngstown S.&T.	3,420,000
Gary, Ind.	U. S. Steel	7,999,000
Kokomo, Ind.	Continental	420,000
Ft. Wayne, Ind.	Joslyn Mfg.	37,500
New Castle, Ind.	Borg-Warner	64,000
Duluth, Minn.	U. S. Steel	973,000
Totals 17 plants	14 companies	29,567,900
BUFFALO DISTRICT		
Cortland, N. Y.	Wickwire Bros.	28,730
Syracuse, N. Y.	Crucible	61,380
Lockport, N. Y.	Simonds Saw	21,600
Buffalo, N. Y.	Republic	900,000
Lackawanna, N. Y.	Bethlehem	6,000,000
Tonawanda, N. Y.	Colorado F. & I.	295,000
Tonawanda, N. Y.	Allegheny Lud.	4,000
Dunkirk, N. Y.	Allegheny Lud.	33,000
Irvine, Pa.	National Forge	25,000
Erie, Pa.	Erie Forge	284,000
Totals 10 plants	9 companies	7,652,710
ST. LOUIS DISTRICT		
Peoria, Ill.	Keystone S. & W.	600,000
Alton, Ill.	Laclede Steel	600,000
Granite City, Ill.	Granity City Steel	1,440,000
Kansas City, Mo.	Armco	840,000
Totals 4 plants	4 companies	3,480,000
SOUTHERN DISTRICT		
Newport News, Va.	N. N. Ship. & D. D.	15,000
Roanoke, Va.	Roanoke Electric	25,000
Atlanta, Ga.	Atlantic Steel	325,000
Tampa, Fla.	Florida Steel	51,000
Knoxville, Tenn.	Knoxville Iron	38,000
Ensley, Ala.	U. S. Steel	1,770,000
Fairfield, Ala.	U. S. Steel	2,227,000
Birmingham, Ala.	Porter-Connors	150,000
Birmingham, Ala.	So. Electric Steel	66,000
Gadsden, Ala.	Republic	1,209,000
Anniston, Ala.	Kilby Steel	34,020
Jackson, Miss.	Mississippi Steel	45,000
Sand Springs, Okla.	Armco	140,000
Ft. Worth, Tex.	Texas Steel	192,280
Lone Star, Tex.	Lone Star Steel	800,000
Longview, Tex.	Le Tourneau	90,000
Houston, Tex.	Armco	1,365,000
Houston, Tex.	Cameron Iron	58,800
Pampa, Tex.	Cabot Shops	18,000
Totals 19 plants	17 companies	8,619,100
WESTERN DISTRICT		
Pueblo, Colo.	Colorado F. & I.	1,800,000
Geneva, Utah	U. S. Steel	2,300,000
Helena, Ariz.	West. Rolling Mills	60,000
Seattle, Wash.	Bethlehem	246,000
Seattle, Wash.	Isaacson	102,000
Seattle, Wash.	N.W. Steel R.M.	53,000
Portland, Oreg.	Oregon Steel	150,000
S. San Fran., Calif.	Bethlehem	276,000
Emeryville, Calif.	Judson	76,500
Niles, Calif.	Pacific States Steel	265,000
Pittsburg, Calif.	U. S. Steel	380,000
Los Angeles, Calif.	Bethlehem	478,000
Los Angeles, Calif.	S. W. Steel R. M.	100,000
Torrance, Calif.	U. S. Steel	237,000
Torrance, Calif.	Armco	50,000
Fontana, Calif.	Kaiser	2,933,000
Totals 16 plants	12 companies	9,506,500
Total U. S. 149 plants	84 companies	148,570,970

done to eliminate the possibility of conflict and confusion likely to result if two sets of figures are presented as authoritative.

STEEL will continue to project production estimates beyond the current week for which data have been assembled by the institute. Those projections will be based on information collected by STEEL's editors covering the district steel product markets.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 138 & 139

Sheetmakers' schedules continue to loosen up as a result of deferments and cancellations. Even galvanized sheet supply is a little easier, a few spots opening up in schedules for late second quarter delivery, especially for the conventional coatings.

In general, demand is still strong, most makers quoting May and beyond on hot rolled sheets and June on cold rolled. Mill spokesmen, however, say they are catching up rapidly on most order backlogs. Buying by manufacturers of appliances, office furniture, and shipping containers is good, though not booming. This also applies to buying by the service centers.

Outright cancellations don't aggregate much tonnage, but setbacks are continuing, notably from the auto industry and auto partmakers. Such parts as frames and bumpers are involved. Appliance makers are not taking in steel as fast as they were, and sluggish building activity is showing up in demand for galvanized steel.

For May and June, some consumers are dragging their feet in placing orders. This is particularly noticeable in auto industry buying. Until a few weeks ago, the industry had no hesitancy in advising mills that it would want full mill quotas.

Inland Steel Co., Chicago, which has maintained controlled acceptance of orders through March and April, states only galvanized sheets and tin plate will be so controlled in May and June. The company's weakest items are hot rolled sheets and plates. Tightest are galvanized sheets, tin plate, and some structurals.

Seasonal revival in demand is developing for corrugated galvanized sheets, heavier gages, for culvert-drainage.

Distributors . . .

Prices, Page 142

Joseph T. Ryerson & Son Inc., Chicago, has revised its price schedule on hot rolled carbon steel in its New York and Philadelphia districts.

The new schedule is based on a combined application of item extras and order quantity discounts. The same pricing basis has been in effect in some areas nine months. The over-all effect on customers is a reduction of $1, although the schedule includes both increases and decreases.

The changes affect quantity extras applicable to items under 1000 lb and orders under 5000 lb. Significant reductions are made where small items are combined in orders totaling 400 lb or more. Increases apply principally to single items purchased alone in small quantities.

Strong indications are appearing in many sections of the country

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that foreign steel prices will drop sharply soon as a result of a substantial rise in domestic offerings. Steel service centers have restored their inventories almost to normal levels, although some sizes and gages are still missing in the more popular products. Most signs point to an early return of a buyers' market.

Steel Bars . . .

Bar Prices, Page 137

Leading sellers of hot rolled carbon bars will be fairly well caught up on their arrearages by the end of March. Chief reasons: Post-strike production exceeded expectations, so did cutbacks and cancellations.

Curtailments reflect the general feeling among buyers that they will not have to stock as much as they had expected to protect their future needs. However, producers anticipate active operations through the first half, especially if auto requirements hold up reasonably well as the spring advances.

Deliveries against new orders for hot carbon bars can be had in late April and early May, and on hot alloy bars around mid-April. Converters have built up stocks of hot rolled, and they are ordering less tonnage for the second quarter.

Most producers of cold drawn bars have openings in their April schedules. Their March shipments are on schedule. Among consumers easing demand pressure are forge shops and boltmakers.

Although March will be a month of near-record production of hot rolled bars at Pittsburgh, a leading supplier there won't be able to meet all his shipping commitments. His March order book is bulging at the seams, and the company has been turning down new orders for March.

Barmakers in the area had a larger first quarter backlog than they could get out on time, but they'll probably catch up with delivery promises by April and be current thereafter. There have been some deferments of March tonnage until April and May, but they haven't been sufficiently large to allow the mills to take up all the last minute new orders that have been offered them.

The Springfield, Mass., armory has closed on 385 tons of alloy steel bars with Copperweld Steel Co., Warren, Ohio. Watervliet, N. Y., arsenal closes Mar. 14 on 375 tons of rough machined alloy vertical quenched forgings.

Tubular Goods . . .

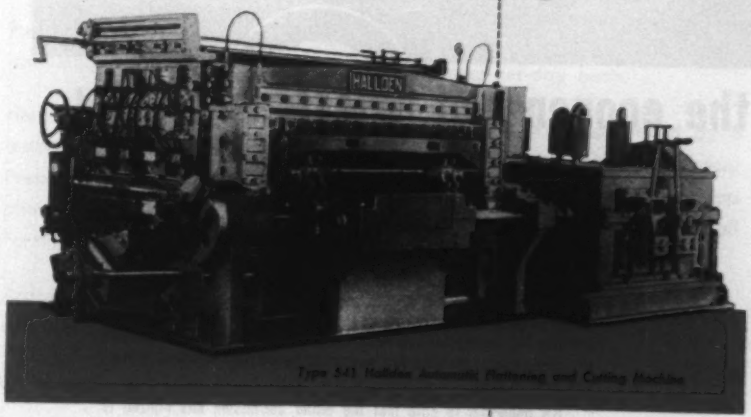
Tubular Goods Prices, Page 141

Mechanical tubing producers have received some order cutbacks because of revisions in auto manufacturing schedules. But the curtailments have not caught up with all of the auto industry's suppliers.

February shipments of one mechanical tubing supplier were 10 per cent below January's. "We'll have some carryover from February," a sales official comments. "Unless we get some more cancellations, our March shipments should equal last month's. We're taking orders for April delivery, but we have some that stretch as far ahead as July; they're about 10 per cent below normal. Our second quarter operations should average 75 to 80 per cent of capacity."

Rotary oil drilling for the week

Stamco
announces
the addition of HALLDEN equipment to their complete line of steel mill equipment. Hallden and Stamco, teamed together ..available from one source for complete integrated planning.



Type 541 Hallden Automatic Flattening and Cutting Machine

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Slitting and Coiling Lines • Cut-To-Length Lines • Flying Shear Lines • Power Squaring Shears • Automatic Resquaring • Corrugating • Culvert • Steel Mill Equipment

ended Feb. 22 increased by 65 rigs —to 1683, but the count was far below the year ago figure of 1861, reports Hughes Tool Co.

While the Gadsden, Ala., plant of Republic Steel Corp. has a substantial order backlog for large diameter steel pipe, last week it was forced to close down its pipe mill because of held up deliveries for projects awaiting the granting of permits by the Federal Power Commission. Several gas pipelines are included.

About 150,000 tons of steel plates will be used in the production of 600 miles of pipe (16 through 30 in. in diameter) for the Michigan Wisconsin Pipe Line Co. The $25 million order was recently booked by A. O. Smith Corp.

Prices on Chlorine and Soda Ash Are Increased

The Columbia-Southern Chemical Corp., Pittsburgh, increased prices $2 a ton on liquid chlorine; $2.50 a ton on soda ash; $2 a ton on high-test flake calcium chloride; and $1 a ton on regular flake calcium chloride. The increases are effective immediately on spot sales and Apr. 1 on contract sales and public-fund quotations.

The increases on chlorine and soda ash are the first made by the company since 1956, the first on calcium chloride since 1957.

Wire . . .

Wire Prices, Pages 139 & 140

Most producers of manufacturers wire and cold heading wire are seeking new orders to fill capacity through May and June. Some have openings in April schedules.

Converters of specialties in New England have built up stocks of rods with shipments against lead-time near normal. Producers of automotive fasteners are getting some deferments, but screw manufacturers are still replacing distributors' stocks but under less pressure.

Plates . . .

Plate Prices, Page 137

Of all the major flat rolled products plates are in easiest supply. Sheared plates can be had for delivery within four to six weeks, depending on specifications, and alloy and clad plates in six to eight weeks.

A continued lag in shipwork, railroad, and fabricated pipe requirements is being felt. Tank work is spotty. At Pittsburgh, it's reported that tankbuilders are trying to liquidate surplus stocks. However, it's reported that fuel mixing plants in several areas are inquiring for small tanks.

Pittsburgh area producers are sold out through March on sheared plates, but their customers are in no hurry to place April tonnage. Chances are good, though, they'll make the month a sellout before leadtime expires.

In universal plates, the situation is less favorable. Getting orders to fill the open spots in April schedules is going to be a man-size job.

Current mill operations are close to capacity, but platemakers say the second quarter outlook isn't as bright as they had expected. Still, it's considered good. Indications are that the plate mills will operate at 75 to 80 per cent of capacity in the period.

Producers have had some sizable tonnages deferred and canceled, but

the economy of miller quality

. . . . becomes evident after sufficient exposure to the original cost/maintenance costs/production/profits equation.

Exploiting the full potential of better basic design, the Miller Gold Star 300 series ac-dc welders convert in minutes from the prime ac-dc welder of exceptional performance to any of these three A-C applications: Metallic Arc, manual or automatic Inert Gas; or, to any of the following D-C applications: Metallic Arc, manual or automatic Inert Gas, or Inert Gas spot welding.

It's important to note that the Miller conversion kits utilized to obtain any of the above simply extend the built-in superiority of the 300 series' welding characteristics into the type of application desired. It's adaptable by design — not discovery.

Available in 200, 300, 400 and 600 ampere models, all feature the exclusive Miller transformers and semi-metallic rectifiers. Complete specifications, including duty cycle chart, will be sent promptly upon request.

miller ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN

• Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

the big change in the market situation is a more relaxed attitude on the part of buyers.

Pig Iron . . .

Pig Iron Prices, Page 142

Demand for merchant iron is declining. More foundries are scheduling operations on a four day week. Melters show an increasing tendency to cover their needs on a short term basis.

Foundry officials are watching the automotive industry closely for a cue to second quarter business prospects. If second quarter auto sales don't pickup, there may be some cutbacks in buying of castings by that industry.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 143

Japan has contracted with the Crow's Nest Pass Coal Co., Fernie, B. C., for 225,000 tons of coking coal. The order is said to be the largest placed by Japan in the dominion, and additonal contracts are being negotiated.

The coal will cost Japan $10.50 a ton, including shipping charges. The Canadian government also will pay a subvention of $4.50 a ton.

Structural Shapes . . .

Structural Shape Prices, Page 137

Structural steel demand is livelier. Orders are picking up a little, and inquiries are more numerous and larger on the average.

Some fabricators are confident March will be an active month.

Shape deliveries are stiffening. Wide flange sections are now quoted for late April, standard shapes early April. However, there are no indications of a shortage in supply.

Wide flange beam producers are sold out through March at Pittsburgh, but they're undecided whether they'll be able to continue capacity operations during April. Buyers are taking their time placing forward requirements. In the Chicago area, however, a full April book is regarded as certain.

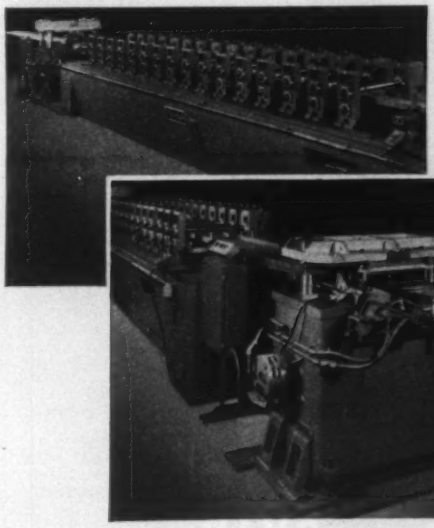
With few exceptions, standard structurals are readily available in almost any quantity. Producers have full books for March on some sizes, but they can take additional business in sizes where capacity is greatest.

Although demand from the railroads is good, other markets leave much to be desired. Auto frame producers aren't buying far ahead. More bridge volume is being estimated in New England, with competition among fabricators keen.

January bookings of fabricated structural steel were 221,222 tons, off 6 per cent from January, 1959, reports the American Institute of Steel Construction. Shipments during the month were also down, totaling 209,031 tons vs. 224,260 a year ago.

Industry backlog dropped for the first time in the last six months, standing at 2,115,629 tons. Of this total, 1,199,192 tons are scheduled for fabrication during the four months ending May 31, the institute reports.

Fourteen thousand tons of West German steel will be used in construction of the superstructure of the Balboa Bridge across the Panama Canal, the general award going to John F. Beasley Construction Co., Dallas, on a bid of $9,119,000. The company had made an alternate bid



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•

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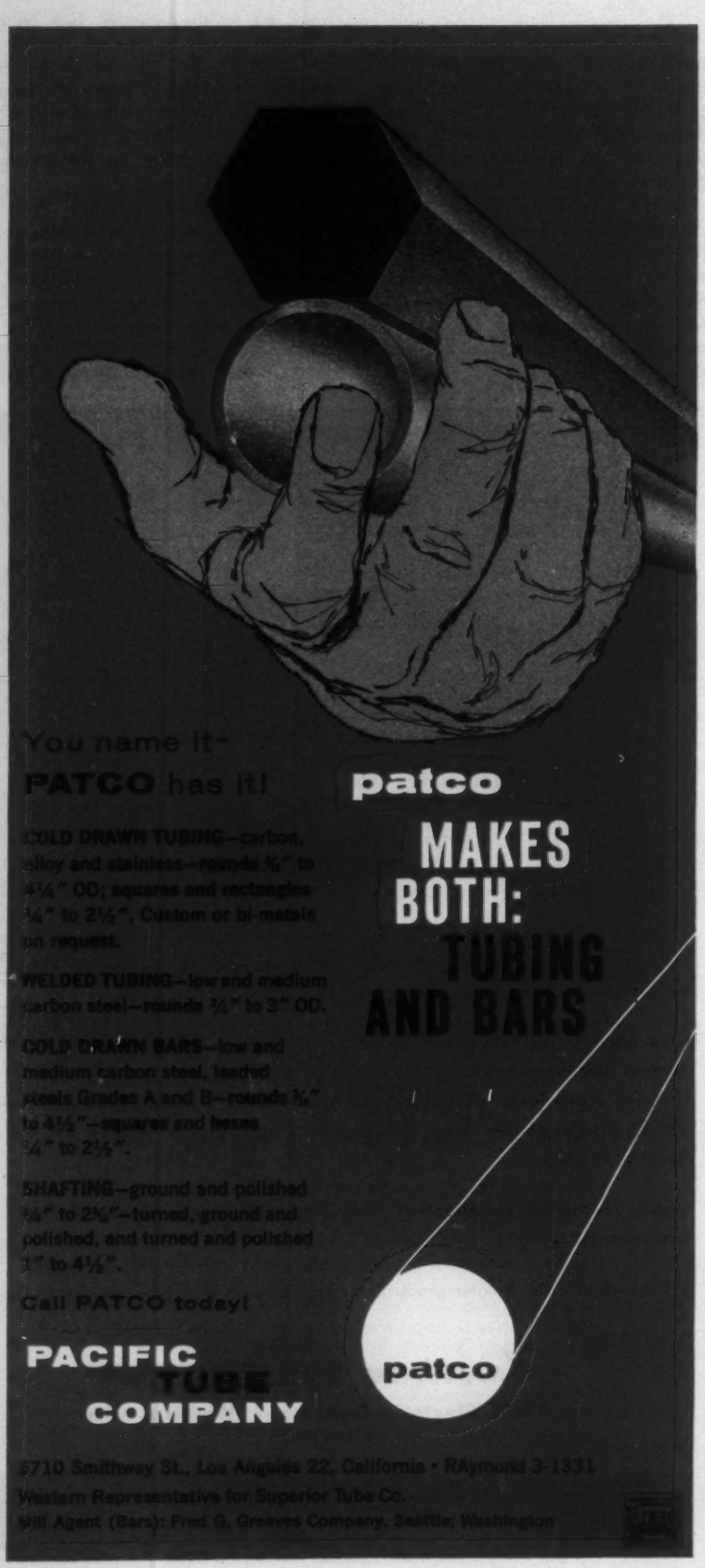
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of $10,849,000 based on the use of steel fabricated in the U. S.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7500 tons, extension, Chevrolet assembly plant, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

1453 tons, state bridgework, FALIE 59-2, Nassau County, New York, through A. E. Ottaviano, general contractor, to Ernst Iron Works, Buffalo.

1090 tons, laboratory, Colgate-Palmolive-Peet Co., Piscataway Township, New Jersey, through Turner Construction Co., general contractor, to Harris Structural Steel Co., New York.

930 tons, junior and senior high school, Tyrone, Pa., to Goetz Welding Co., Harrisburg, Pa.

865 tons, animal medical center, New York, to Lafayette Iron Works, Jersey City, N. J.

620 tons, plant, Masland-Duraleather Co., Mocksville, N. C., to Brenner Iron & Metals Co.

435 tons, merchandise building, Western Electric Co., Baltimore, to Belmont Iron Works, Eddystone, Pa.

400 tons, fruit warehouse at Wenatchee, Wash. (job completed) to Taft Structurals Inc., Seattle.

390 tons, state bridgework, FARC 59-133, Nassau County, New York, through Lizza & Sons Co., general contractor, to Ernst Iron Works, Buffalo.

225 tons, warehouse at Oroville, Wash., to Taft Structurals Inc., Seattle.

160 tons, addition, Olympia Brewing Co., Tumwater, Wash., to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

53,000 tons, towers, Narrows bridge, Triboro Bridge & Tunnel Authority, New York; Bethlehem Steel Co., Bethlehem, Pa., low on a bid covering the two towers, and low on a bid covering one tower, involving 26,500 tons on the Staten Island side, with Harris Structural Steel Co., New York, low on the other of equal size on the Brooklyn side. Because bids on the individual towers total substantially less than the bid for the two towers combined, it would seem that Bethlehem and Harris will share the work. Bids on the 66,000 tons for the suspended structure will come up for figuring later.

14,000 tons, Balboa Bridge, Panama Canal, to John F. Beasley Construction Co., Dallas, steel to be fabricated in West Germany. The award was made by the Panama Canal Co. on a bid of $9,119,000. The Beasley Company had submitted an alternate bide of $10,849,000, which would have involved the use of steel fabricated in the U. S.

9600 tons, state bridgework FIGE 60-2, Kings County, New York; bids Mar. 17.

9500 tons, contract No. 5, Port Mann bridge; Dominion Bridge Co., Burnaby, B. C., is low at $6,894,287 to the British Columbia Department of Highways, Victoria, B. C.

6500 tons, Elizabeth River tunnel, Portsmouth, Va.; Diamond Construction Co., Atlanta, Ga., low on the general contract.

4500 tons, George Washington Bridge bus terminal, Port of New York Authority, New York; bids postponed indefinitely.

2500 tons, police academy, Queens, New York, Depot Construction Co. is low on the general contract.

1830 tons, section, Jones Falls Expressway, Baltimore; C. J. Langenfelder, Baltimore, is low on the general contract.

1600 tons, building No. 9, state campus, Albany, N. Y.; bids Mar. 9.

1300 tons, state bridgework, FICDE 60-1, New York, Johnson, Drake & Piper is low on the general contract.

1230 tons, state bridgework, FAILE 60-1, Nassau and Suffolk counties, New York; bids Mar. 17.

1028 tons, sections FAC 60-7 and FASH 60-2, Monroe County, New York; bids Mar. 17.

800 tons, Nassau County Welfare Home, Long Island, New York; bids closed Mar. 1.

734 tons, state bridgework, Forest County, Pennsylvania; bids Mar. 24; also, 192 tons of reinforcing bars.

575 tons, radio receiver plant addition, Gen-

eral Electric Co., Utica, N. Y.

500 tons, material and process building, General Electric Co., Schenectady, N. Y.

500 tons, two underground science buildings, American Telephone & Telegraph Co.; one at Airmont, N. Y., and the other at Pottstown, Pa., each requiring 250 tons.

248 tons, state bridgework, FARC 60-18, Allegheny County, New York; bids Mar. 17.

218 tons, state bridgework, Union County, N. J.; bids Mar. 16.

150 tons, friary building, Olean, N. Y.; James King & Son, New York, is low on the general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1050 tons, dam project, U. S. Engineer, Everett-Hopkinton, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; the Perini Corp., Framingham, Mass., general contractor.

350 tons, two state highway bridges, Northfield-Tilton, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; Suburban Excavators Inc., Wakefield, Mass., general contractor; also 307 tons, concrete reinforcing bars, and 220 tons of steel piles.

120 tons, addition to Camlin Hotel, Seattle, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Baugh Construction Co., Seattle, general contractor.

REINFORCING BARS PENDING

810 tons, dam overflow section, Dardanelle Lock and Dam, Aiver, Ark.; bids May 5 to the U. S. Engineer, Little Rock, Ark.

192 tons, state bridgework, Forest County, Pennsylvania; bids Mar. 24; also, 734 tons of structural shapes required.

100 tons or more, Idaho State 1560 ft highway bridge; general contract to W. R. Cahoon, Pocatello, low at $569,649.

100 tons or more, $2 million shopping center, Sears, Roebuck & Co., Spokane, Wash.; Max J. Kuney Co. Spokane, is low bidder.

100 tons or more, warehouse, Washington State penitentiary, Walla Walla, Wash.; Johnson, Busboom & Bauh, Spokane, Wash., low at $289,992.

PLATES . . .

PLATES PLACED

150 tons, 1.5 million gallon elevated watertank, Edmonds, Wash.; to Chicago Bridge & Iron Co., Seattle, low at $51,065.

PLATES PENDING

13,000 tons, penstocks and surge tanks, Oahe Reservoir project, near Pierre, S. Dak.; bids Apr. 14, U. S. Engineer, Omaha, Nebr.; also 1000 tons of structurals and 1750 tons of concrete reinforcing bars.

PIPE . . .

CAST IRON PIPE PLACED

638 tons, 12 and 16 in., for Anchorage, Alaska, to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

517 tons, 3 to 10 in. water mains; bids to King County Water District, No. 49, Burien, Wash., Mar. 3.

334 tons, 4 to 16 in.; bids to Tacoma, Wash., Feb. 29.

166 tons, 4 to 8 in.; bids to Seattle, Mar. 2.

RAILS, CARS . . .

RAILROAD CARS PLACED

Baltimore & Ohio, 2208 cars to its Dubois, Pa. shops; the list includes 2000 fifty-ton hoppers; 78 flatcars, 47 ft long; 70 flatcars, 53½ ft long; and 60 forty-seven-ft piggyback flatcars.

Illinois Central, 150 seventy-ton twin hopper cars, to American Car & Foundry Div., ACF Industries Inc., New York, and 20 seventy-ton covered hopper cars to General American Transportation Corp., Chicago.

Union Tank Car Co., 67 tankcars, to the company's own shops at Whiting, Ind.

RAILROAD CARS PENDING

U. S. Army Transportation Corps, St. Louis, ten 70-ton hoppers, 16 fifty-ton flatcars, and one fifty-ton boxcar.

Iron Ore Statistics—December, 1959

(Net tons)

STOCKS OF IRON ORE & AGGLOMERATES IN U. S. & CANADA

Stocks at:	U. S. Ores L. Sup.	U. S. Ores Other	Canadian Ores L. Sup.	Canadian Ores Other	Foreign Ores	Total End of Month
U. S. Furnaces						
Eastern	3,705,383	334,063	137,477	2,003,643	6,829,104	13,009,670
Pitts.-Valley	7,814,948	83,788	825,767	3,613,225	3,727,471	16,065,199
Cleve.-Detroit	7,388,475	90,727	768,246	1,109,144	711,263	10,067,855
Chicago	11,199,538	(a)	(a)	.....	(a)	11,199,538
Southern	(a)	1,990,353	.....	(a)	3,446,218	5,436,571
Western	.....	1,161,794	.....	.....	(a)	1,161,794
Total	30,108,344	3,660,725	1,731,490	6,726,012	14,714,056	56,940,627
At U. S. Docks:						
Lake Erie	2,547,408	.....	296,607	2,174,824	2,556,550	7,575,384
Other U. S. docks	.....	.....	.....	(a)	(a)	(a)
Total	2,547,408	.....	296,607	2,174,824	2,556,550	7,575,384
Total U. S. Stocks	32,655,747	3,660,725	2,028,097	8,900,836	17,270,606	64,516,011
Total Canadian Stocks	1,471,322	.....	263,582	964,035	39,876	2,738,815
Total U. S. & Canada	34,127,069	3,660,725	2,291,679	9,864,871	17,310,482	67,254,826

CONSUMPTION OF IRON ORE & AGGLOMERATES IN U. S. & CANADA

(Net tons)

In U. S. Districts:	U. S. Ores L. Sup.	U. S. Ores Other	Canadian Ores L. Sup.	Canadian Ores Other	Foreign Ores	Total For Month
Eastern	635,277	255,458	37,383	389,287	1,145,262	2,442,667
Pitts.-Valley	1,784,687	129,510	119,773	701,972	915,370	3,651,312
Cleve.-Detroit	1,206,575	57,737	263,707	131,632	248,397	1,915,048
Chicago	1,993,589	(a)	(a)	.....	(a)	1,993,589
Southern	(a)	610,074	.....	(a)	341,183	951,257
Western	.....	585,358	.....	.....	(a)	585,358
In U. S.						
Blast furnaces	3,945,710	1,038,697	306,362	724,321	1,026,002	7,041,092
Steel furnaces	129,262	76,739	8,818	6,881	652,102	873,802
Sintering (1)	1,547,156	518,446	110,483	469,457	970,427	3,615,969
Miscellaneous (2)	.....	4,255	200	2,232	1,681	8,368
Total U. S.	5,622,128	1,638,137	425,863	1,202,891	2,650,212	11,539,231
In Canada:						
Blast furnaces	165,301	.....	106,881	160,022	.....	432,204
Steel furnaces	4,657	.....	.....	15,840	11,562	32,059
Sintering (1)	36,179	.....	18,420	49,314	.....	103,913
Miscellaneous (2)	.....	.....	.....	.....	.....	.....
Total Canada	206,137	.....	125,301	225,176	11,562	568,176
Total U. S. & Canada	5,828,265	1,638,137	551,164	1,428,067	2,661,774	12,107,407

a—Included in other districts.

1—Consumed in sintering plants not at mine site.

2—Sold to nonreporting companies or used for purposes not listed.

Data from American Iron Ore Association.

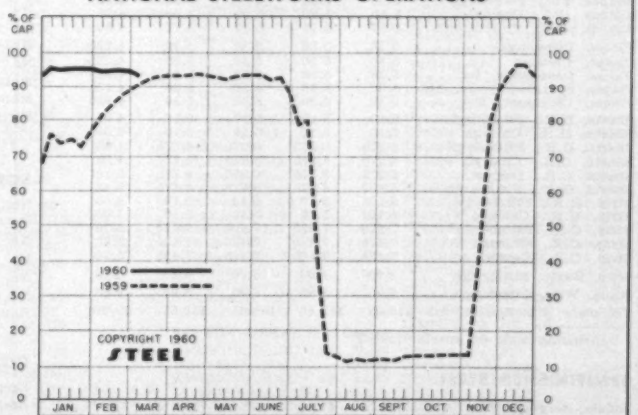
DISTRICT INGOT RATES

(Percentage of Capacity utilized)

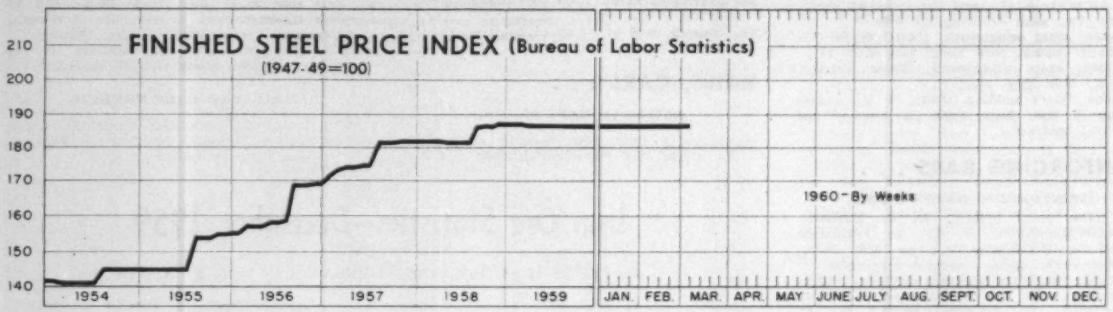
	Week Ended Mar. 6	Week Ago	Month Ago	Year Ago
Northeastern	91	92	98	92
Buffalo	99	100	97	98
Pittsburgh	98	96	98	94
Youngstown	87	89	91	84
Cleveland	101	102	99	89
Detroit	100	102	82	98
Chicago	95	98	96	91
Cincinnati	104	101	103	86
St. Louis	100	103	97	105
Southern	85	88	94	89
Western	86	90	90	86
Total Industry	93.1	94.4	94.2	90.3
Index (1947-49=100)	165.2	167.5	167.0	159.1
Net tons (In thousands)	2,654	2,690	2,683	2,556

Current week's figures are preliminary. Weekly capacity (net tons): 2,849,306 in 1960 and 2,831,331 in 1959. Source: American Iron & Steel Institute.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Mar. 1, 1960	Week Ago	Month Ago	Feb. Index	Year Ago
186.8	186.8	186.8	186.8	186.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Mar. 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.765
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.585
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.685
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.766
		Woven Wire Fence (20-rod roll)	21.880

STEEL's FINISHED PRICE INDEX*

	Mar. 2 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	247.82	194.53
Index in cents per lb	6.713	6.713	6.713	6.713	5.270

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.96	$117.82
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	35.00	36.17	42.00	42.33	39.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Mar. 2 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	5.85
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.65	$9.05

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton

	Mar. 2 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	55.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld., Cin.	70.20	70.20	70.20	70.20	60.58
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net tons†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$35.50	$36.50	$42.50	$44.50	$38.50
No. 1 Heavy Melt, E. Pa.	36.00	38.00	42.00	40.00	39.50
No. 1 Heavy Melt, Chicago	33.50	34.00	41.50	42.50	34.00
No. 1 Heavy Melt, Valley	37.50	39.50	47.50	46.50	37.50
No. 1 Heavy Melt, Cleve.	34.50	36.50	43.50	42.50	34.00
No. 1 Heavy Melt, Buffalo	31.50	36.50	36.50	39.50	32.50
Rails, Rerolling, Chicago	57.50	59.50	63.50	62.50	49.50
No. 1 Cast, Chicago	46.50	47.50	55.50	48.50	40.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.00	$13.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	32.00	25.25

Steel Prices

Mill prices as reported to STEEL, Mar. 2, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 138; footnotes, page 140.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 .. 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 .. 80.00
S.Duquesne,Pa. U5 ... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 . 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 .... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 .. 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 99.50
S.Duquesne,Pa. U5 ... 99.50
S.SanFrancisco B3 .... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $119.00
Bridgeport,Conn. C32 . 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 .... 119.00
Conshohocken,Pa. A3 . 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 .... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 .... 119.00
Johnstown,Pa. B2 .... 119.00
Lackawanna,N.Y. B2 .. 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 .... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 .... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 .... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 119.00
S.Duquesne,Pa. U5 .... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 .. 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Ind.Harbor,Ind. Y1 .... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 .... 5.05

WIRE RODS
AlabamaCity,Ala. R2 .. 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 .. 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 .... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 .... 6.65
Monessen,Pa. P7 ..... 6.40
Pittsburg,Calif. C11 .... 7.20
Portsmouth,O. P12 .... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 .. 6.40
SparrowsPoint,Md. B2 .. 6.50
Sterling,Ill.(1) N15 .... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A 7.... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 .. 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 .... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2 ,Y1.. 5.50
Johnstown,Pa. B2 .... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 .... 5.60
Lackawanna,N.Y. B2 .. 5.55
Los Angeles B3 ..... 6.20
Minnequa,Colo. C10 .... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 .... 5.55
Portland,Oreg. O4 .... 6.25
Seattle B3 ..... 6.25
S.Chicago, Ill. U5, W14 .. 5.50
S.SanFrancisco B3 .... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance, Calif. C11 .... 6.20
Weirton,W.Va. W6 .... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 .... 6.45
IndianaHarbor,Ind. I-2 .. 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 .... 5.55
S.Chicago,Ill. U5 .... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W16 .... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 .. 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 .... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1.. 8.05
Johnstown,Pa. B2 .... 8.10
KansasCity,Mo. S5 .... 8.15
Lackawanna,N.Y. B2 .. 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14.. 8.05
S.SanFrancisco B3 .... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 .... 8.05
Lackawanna,N.Y. B2 .. 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 .... 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 .... 6.50
Lackawanna,N.Y. B2 .. 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 .... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 .. 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 .... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 .... 5.30
Conshohocken,Pa. A3 .. 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 .. 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 .... 5.40
Harrisburg,Pa. P4 .... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1.. 5.30
Johnstown,Pa. B2 .... 5.30
Lackawanna,N.Y. B2 .. 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 .... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 .. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 .... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 .... 5.30
Youngstown(27) R2 .... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .... 7.05
Fontana,Calif. K1 .... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 14.10

PLATES, H.S. L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 .... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 .... 7.95
Conshohocken,Pa. A3 .. 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1. 7.95
Johnstown,Pa. B2 .... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14.. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 .... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 .... 7.50
Coatesville,Pa. L7 .... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 .... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 .... 7.50
Johnstown,Pa. B2 .... 7.50
Lowellville,O. S3 .... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 .. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
Ind.Harbor,Ind. I-2 .... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l. (15) A10 .. 5.55
Ashland l.c.l. (15) A10 . 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ... 5.675
Aliquippa,Pa.(9) J5 ... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 .. 5.675
Birmingham(9) C15 .. 5.675
Buffalo(9) R2 ..... 5.675
Canton,O.(23) R2 ..... 6.15
Clairton,Pa.(9) U5 .... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 .... 5.675
Emeryville,Calif. J7 .... 6.425
Fairfield,Ala.(9) T2 .. 5.675
Fairless,Pa.(9) U5 ... 5.825
Fontana,Calif.(9) K1 .. 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1.. 5.675
Johnstown,Pa.(9) B2 .. 5.675
Joliet,Ill. P2 ..... 5.675
KansasCity,Mo.(9) S5.. 5.925
Lackawanna(9) B2 .... 5.675
LosAngeles(9) B3 .... 6.375
Massillon,O.(23) R2 .... 6.15
Midland,Pa.(23) C18 .. 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
Owensboro,Ky.(9) G8 .. 6.025
Pittsburg,Calif.(9) C11. 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
Riverdale,Ill.(9) A1 .. 5.675
Seattle A24, B3, N15 .. 6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5.. 5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15 .5.675
Sterling,Ill.(9) N15 .... 5.775
Struthers,O.(9) Y1 .... 5.675
Tonawanda,N.Y. B12 .. 5.675
Torrance,Calif.(9) C11 .. 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2,U5.. 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 .... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 .... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 .... 6.725
KansasCity,Mo. S5 .... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 .... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 .... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14.. 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 .... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 .... 8.30
Johnstown,Pa. B2 .... 8.30
KansasCity,Mo. S5 .... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14.. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 .... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .. 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5.. 5.925
Lackawanna(9) B2 .... 5.675
Sterling,Ill. N15 .... 5.775
Sterling,Ill.(1) N15 .. 5.675
Tonawanda,N.Y. B12 .. 5.675

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SIZE ANGLES; S. SHAPES Wrought Iron
Economy,Pa. B14 ..... 16.45

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 .... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Loaded (Including loaded extra) Carbon
LosAngeles P2, S30 .. 11.75*

Alloy
Ambridge,Pa. W18 .... 10.175
BeaverFalls,Pa. M12.. 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 .7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2.. 7.65
Hartford,Conn. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2.. 9.10
Mansfield,Mass. B5 .... 8.20
Massillon,O. R2, R8 .... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 .... 7.90
Putnam,Conn. W18 .... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 .... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 .. 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 . 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .... 9.025
Bridgeport,Conn. C32 .. 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 .... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .. 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 .... 9.025
Hammond,Ind. J5, L2.. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. R5 ..... 9.025
Lackawanna,N.Y. B2 .. 9.025
LosAngeles P2, S30 .... 11.00
Mansfield,Mass. B5 .... 9.325
Massillon,O. R2, R8 .... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 .... 9.225
S.Chicago,Ill. W14 .... 9.025
SpringCity,Pa. K3 .... 9.20
Struthers,O. K1 ..... 9.025
Warren,O. C17 ..... 9.025

Waukegan,Ill. A7 ....9.025
Willimantic,Conn. J5 ..9 325
Worcester,Mass. A7 ...9 325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I2,Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ...6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 .6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill. (1) N15 ..5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ...7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ....7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 15.10
Economy,Pa.(D.R.)B14 19.30
Econ.(DirectRolled)B14 13.55
Economy(Staybolt)B14 19.80
McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ...19.80
McK.Rks.(Staybolt)L5. 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2.5.575
ChicagoHts.(4)(44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O. (3) P11 ....5.575
Tonawanda (3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ...5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 .5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ...5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 .....5.875
Warren, O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2 ..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(38) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(33) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	....
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2..6.875‡
Ashland,Ky. A10 ....6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt., Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ..6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ...7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O. (28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625
Irvin,Pa. U5 (type 1) .9.525

SHEETS, Enameling

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
SparrowsPoint,Md. B2..6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke. Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co., Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N. Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div. Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	5.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
San Francisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2 S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2 Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. W10	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. S18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.55
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fosto ia,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y. R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	0.80C	1.05C	1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fosteria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9 35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, Hot Dipped Common Coke	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill G4	9.875*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPt.,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity, Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven Conn. A7	12.95
Palmer,Mass W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13 40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minneque,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10 05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt., Md. B2	9.85
Struthers O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C16	16.55
Monessen,Pa. P16	16.30
Muncie, Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville Ill. K4	17.15
Monessen Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson, Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville, Ind. M8	12.35
Dover, O. G6	12.35
Farrell, Pa. S3	12.35
Fostoria, O. S1	12.35
Franklin Park, Ill. T6	12.45
Kokomo, Ind. C16	12.35
Massillon, O. R8	12.35
Milwaukee C23	12.55
Monessen, Pa. P7, P16	12.35
Palmer, Mass. W12	12.65
Pawtucket, R.I. N8	12.65
Philadelphia P24	12.65
Riverdale, Ill. A1	12.45
Rome, N.Y. R6	12.35
Sharon, Pa. S3	12.35
Trenton, N.J. R5	12.65
Warren, O. B9	12.35
Worcester, Mass. A7, T6	12.65

NAILS, Stock — Col.

Alabama City, Ala. R2	173
Aliquippa, Pa. J5	173
Atlanta A11	175
Bartonville, Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville, Ind. M8	175
Donora, Pa. A7	173
Duluth A7	173
Fairfield, Ala. T2	173
Houston S5	178
Jacksonville, Fla. M8	175
Johnstown, Pa. B2	173
Joliet, Ill. A7	173
Kansas City, Mo. S5	178
Kokomo, Ind. C16	175
Minnequa, Colo. C10	178
Monessen, Pa. P7	173
Pittsburg, Calif. C11	192
Rankin, Pa. A7	173
S. Chicago, Ill. R2	173
Sparrows Pt., Md. B2	175
Sterling, Ill. (7) N15	175
Worcester, Mass. A7	179

(To Wholesalers: per cwt)

Galveston, Tex. D7	$10.30

NAILS, Cut (100 lb kegs)

Wheeling, W.Va. W10	$10.10

POLISHED STAPLES — Col.

Alabama City, Ala. R2	175
Aliquippa, Pa. J5	173
Atlanta A11	177
Bartonville, Ill. K4	175
Crawfordsville, Ind. M8	177
Donora, Pa. A7	173
Duluth A7	173
Fairfield, Ala. T2	173
Houston S5	180
Jacksonville, Fla. M8	177
Johnstown, Pa. B2	175
Joliet, Ill. A7	173
Kansas City, Mo. S5	180
Kokomo, Ind. C16	177
Minnequa, Colo. C10	178
Pittsburg, Calif. C11	194
Rankin, Pa. A7	173
S. Chicago, Ill. R2	175
Sparrows Pt., Md. B2	177
Sterling, Ill. (7) N15	175
Worcester, Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box) Coil No. 3150

Alabama City, Ala. R2	$9.24
Atlanta A11	10.36
Bartonville, Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville, Ind. M8	9.34
Donora, Pa. A7	9.24
Duluth A7	9.24
Fairfield, Ala. T2	9.24
Houston S5	10.51
Jacksonville, Fla. M8	9.34
Johnstown, Pa. B2	9.24
Joliet, Ill. A7	9.24
Kansas City, Mo. S5	10.51
Kokomo, Ind. C16	9.34
Los Angeles B3	9.94
Minnequa, Colo. C10	9.49
Pittsburg, Calif. C11	9.94
S. Chicago, Ill. R2	9.24
S. San Francisco C10	9.94
Sparrows Pt, Md. B2	9.34
Sterling, Ill. (37) N15	9.34

Coil No. 6500 Stand.

Alabama City, Ala. R2	$9.54
Atlanta A11	10.70
Bartonville, Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville, Ind. M8	9.64
Donora, Pa. A7	9.54
Duluth A7	9.54
Fairfield, Ala. T2	9.54
Houston S5	10.85
Jacksonville, Fla. M8	9.64
Johnstown, Pa. B2	9.54
Joliet, Ill. A7	9.54
Kansas City, Mo. S5	10.85
Kokomo, Ind. C16	9.64
Los Angeles B3	10.26
Minnequa, Colo. C10	9.79
Pittsburg, Calif. C11	10.28
S. Chicago, Ill. R2	9.54
S. San Francisco C10	10.26
Sparrows Pt., Md. B2	9.64
Sterling, Ill. (37) N15	9.64

Coil No. 6500 Interim

Alabama City, Ala. R2	$9.59
Atlanta A11	10.75
Bartonville, Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville, Ind. M8	9.69
Donora, Pa. A7	9.59
Duluth A7	9.59
Fairfield, Ala. T2	9.59
Houston S5	10.90
Jacksonville, Fla. M8	9.69
Johnstown, Pa. B2	9.59
Joliet, Ill. A7	9.59
Kansas City, Mo. S5	10.90
Kokomo, Ind. C16	9.69
Los Angeles B3	10.37
Minnequa, Colo. C10	9.84
Pittsburg, Calif. C11	10.31
S. Chicago, Ill. R2	9.59
S. San Francisco C10	10.31
Sparrows Pt., Md. B2	9.69
Sterling, Ill. (37) N15	9.69

BALE TIES, Single Loop — Col.

Alabama City, Ala. R2	212
Atlanta A11	214
Bartonville, Ill. K4	214
Crawfordsville, Ind. M8	214
Donora, Pa. A7	212
Duluth A7	212
Fairfield, Ala. T2	212
Houston S5	217
Jacksonville, Fla. M8	214
Joliet, Ill. A7	212
Kansas City, Mo. S5	217
Kokomo, Ind. C16	214
Minnequa, Colo. C10	217
Pittsburg, Calif. C11	236
S. San Francisco C10	236
Sparrows Pt., Md. B2	214
Sterling, Ill. (7) N15	214

FENCE POSTS — Col.

Birmingham C15	177
Chicago Hts., Ill. C2, I-2	177
Duluth A7	177
Franklin, Pa. F5	177
Johnstown, Pa. B2	177
Marion, O. P11	177
Minnequa, Colo. C10	182
Tonawanda, N.Y. B12	177

WIRE, Barbed — Col.

Alabama City, Ala. R2	193*
Aliquippa, Pa. J5	190§
Atlanta A11	198§
Bartonville, Ill. K4	198
Crawfordsville, Ind. M8	198
Donora, Pa. A7	193†
Duluth A7	193†
Fairfield, Ala. T2	193†
Houston S5	198**
Jacksonville, Fla. M8	198
Johnstown, Pa. B2	196§
Joliet, Ill. A7	193†
Kansas City, Mo. S5	198**
Kokomo, Ind. C16	195†
Minnequa, Colo. C10	198**
Monessen, Pa. P7	196§
Pittsburg, Calif. C11	213†
Rankin, Pa. A7	193†
S. Chicago, Ill. R2	193**
S. San Francisco C10	213*
Sparrows Point, Md. B2	198§
Sterling, Ill (7) N15	198

WOVEN FENCE, 9-15 Ga. — Col.

Ala. City, Ala. R2	187**
Aliq'ppa, Pa. 9-11½ ga. J5	190§
Atlanta A11	192§
Bartonville, Ill. K4	192
Crawfordsville, Ind. M8	192
Donora, Pa. A7	187†
Duluth A7	187†
Fairfield, Ala. T2	187†
Houston S5	192**
Jacksonville, Fla. M8	192
Johnstown, Pa. (43) B2	190§
Joliet, Ill. A7	187†
Kansas City, Mo. S5	192**
Kokomo, Ind. C16	189†
Minnequa, Colo. C10	192**
Pittsburg, Calif. C11	210†
Rankin, Pa. A7	187†
S. Chicago, Ill. R2	187**
Sterling, Ill. (7) N15	192

WIRE (16 gage)	An'ld Galv. Stone	Stone
Ala. City, Ala. R2	17.85	19.40**
Aliq'ppa, Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria, O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan. City, Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r, Mass. W12	18.15	19.70†
Pitts., Calif. C11	18.20	19.75†
S. San Fran. C10	18.20	19.75**
St'ling (37) N15	17.95	19.80
Sparrows Pt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala. City, Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta (48) A11	9.10 9.775§
Bartonville (48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80††
Donora, Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston (48) S5	9.25 9.80**
Jack'ville, Fla. M8	9.10 9.80‡‡
Johnstown (48) B2	9.00 9.675§
Joliet, Ill. A7	9.00 9.55†
Kansas City (48) S5	9.25 9.80**
Kokomo (48) S16	9.10 9.65†
Los Angeles B3	9.95 10.625§
Minnequa C10	9.25 9.80**
Monessen (48) P7	8.65 9.35§
Palmer, Mass. W12	9.30 9.85†
Pitts., Calif. C11	9.95 10.50†
Rankin, Pa. A7	9.00 9.55†
S. Chicago R2	9.00 9.55**
S. San Fran. C10	9.95 10.50**
Spar'ws Pt. (48) B2	9.10 9.775§
St'ling (37) (48) N15	9.10 9.80
Struthers, O. Y1	9.00 9.65‡
Worcester, Mass. A7	9.30 9.85†

Based on zinc prices of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Consumer discounts, per cent off list prices, orders for 1 container for assorted sizes; for less than container quantities, add 25 per cent; attaching nuts to bolts, package sizes, add 7.5 per cent; heavy hex nuts 1⅛ in. through 1½ in. tapped 8 threads, add 10 per cent)

HEX HEAD CAP SCREWS, coarse or fine thread, packaged or bulk, with or without hex nuts, 1020 steel bright and high carbon heat treated, ¼ in. thru 1 in. diam., listed lengths:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packaged	43.75
Bulk	50

BOLTS, standard stock sizes:

Plain Finish	50
Hot Galvanized and zinc Plated:	
Packaged	43.75
*Bulk	50

*Hot galvanized or zinc plated lag bolts only—for package or bulk quantities use applicable list less bulk discounts.

HEXAGON NUTS, American Standard: Finished hex, hex jam, and hex slotted coarse or fine thread, ¼ in. through 3 in., finished hex thick, thick and slotted, castle, fine thread, ¼ in. through 1½ in., semifinished hex heavy, heavy and jam, heavy and slotted, coarse thread, ¼ in. through 4 in., and

SQUARE NUTS, American Standard: Regular square and heavy square, coarse thread, ¼ in. through 2 in.:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packaged	43.75
Bulk	50

CAP AND SETSCREWS Fillister Head, Cap Screws, Coarse Thread:

Packages	+55
Bulk	+16

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter:	
Packages	+85
Bulk	+38

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam, 6 in. and shorter:	
Packages	+ 5
Bulk	+19
Through 1 in. diam., longer than 6 in.:	
Packages	+29

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

⅞ in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Alton, Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
Kansas City, Mo. U3	29.85	43.00	55.40	73.00	95.10
Monessen, Pa. P16	32.15	48.20	61.55	81.10	105.65
New Haven, Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg, Calif. C11	28.95	43.40	55.40	73.00	95.10
Minnequa, Colo. C10	28.95	43.40	55.40	73.00	95.10
Roebling, N.J. R5	28.95	43.40	55.40	73.00	95.10
Sparrows Point, Md. B2	28.95	43.40	55.40	73.00	95.10
St. Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan, Ill. A7	28.95	43.40	55.40	73.00	95.10

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2¾	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer, Pa. U5	5.75	5.60	....	6.725
Ensley, Ala. T2	5.75	5.65	....	6.725
Fairfield, Ala. T2	....	....	....	6.725
Gary, Ind. U5	5.75	5.65	....	....
Huntington, W.Va. C15	....	....	....	6.725
Johnstown, Pa. B2	....	....	....	(16) 6.725
Lackawanna, N.Y. B2	5.75	5.65	....	6.725
Minnequa, Colo. C10	5.75	5.65	....	7.225
Steelton, Pa. B2	5.75	5.65	....	....
Williamsport, Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield, Ala. T2	6.875
Gary, Ind. U5	6.875
Lackawanna, N.Y. B2	6.875
Minnequa, Colo. C10	6.875
Seattle B3	7.025
Steelton, Pa. B2	6.875
Torrance, Calif. C11	6.875

JOINT BARS

Bessemer, Pa. U5	7.25
Fairfield, Ala. T2	7.25
Joliet, Ill. U5	7.25
Lackawanna, N.Y. B2	7.25
Minnequa, Colo. C10	7.25
Steelton, Pa. B2	7.25

AXLES

Ind. Harbor, Ind. S13	9.125
Johnstown, Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
Kansas City, Mo. S5	15.35
Lebanon, Pa. B2	15.35
Minnequa, Colo. C10	15.35
Pittsburgh S44	15.35
Seattle B3	15.85

SCREW SPIKES

Lebanon, Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield, Ala. T2	10.10
Ind. Harbor, Ind. I-2, Y1	10.10
Kansas City, Mo. S5	10.10
Lebanon, Pa. B2	10.10
Minnequa, Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S. Chicago, Ill. R2	10.10
Struthers, O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(12) Worcester, Mass., base.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.395c.
(27) Bar mill sizes.
(28) Bonderized.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(33) Buffalo base.
(33) 14 Ga., 43 in.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds, 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	2.5	+26	+10.5	+36	+21.5	+46	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.75	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on price of zinc at 13.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	50.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp., American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	28.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Strip, Carbon Base —Cold Rolled— Both Sides
Copper*	$36.80	$44.20

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7; New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.500

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	Nom.	Nom.	Nom.	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
Neville Island, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKees Rocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	69.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
Granite City, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% Silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Calvert City, Ky. P15	$99.00
Niagara Falls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry, K2	89.00
Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Buffalo H1 (Intermediate) (0.036-0.075% max)	71.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Neville Island, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Swedeland, Pa. A3 (Intermediate) (Phos. 0.036-0.075% max)	73.00
Troy, N.Y. R2 (Phos. 0.075% max)	73.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[3]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	9.80[a]	10.00[b]	10.06	....	11.45[c]	10.05[d]	11.80#	16.38	9.55	9.90[e]	10.50
Birmingham	9.43[a]	10.20[b]	....	....	10.91[c]	9.59[d]	13.14#	16.76	9.00	9.79[e]	10.90
Boston	10.07	11.42	11.77	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.80[a]	9.95[b]	11.15	55.98	10.65[c]	9.00[d]	11.45#	15.40	9.25	9.00[e]	10.85[f]
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.58#	15.37	9.56	9.27	10.53
Cleveland	8.73[a]	9.85[b]	11.14	52.33	10.51[c]	8.96[d]	11.25#	15.16	9.75	8.92[e]	10.58[f]
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	10.13[a]	10.00[b]	12.19	52.00	11.28[c]	9.42[d]	13.10#	16.55	9.34	9.47[e]	11.31[f]
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.92[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.35	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	9.15[a]	9.55	10.89	52.17	11.10[c]	9.50[d]	11.95#	15.48	9.10	9.55[e]	10.55[f]
Pittsburgh	8.73[a]	9.88[b]	11.03	52.33	10.49[c]	8.85[d]	11.25#	15.05	9.00	8.68[e]	10.32[f]
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.64[a]	9.83	11.28	....	10.30[c]	8.75[d]	9.78	15.43	9.25	8.60[e]	10.37[f]
St. Paul	9.00[a]	9.59[b]	10.74	....	10.66[c]	9.12[d]	11.49#	16.54	9.63	8.95[e]	10.49
San Francisco	9.65	11.10	11.55	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane, Wash.	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; #net price, 1 in. round C-1018.

[a]10 Ga.; [b]20 Ga.; [c]⅛ x 1 in.; [d]¾-2½ in.; [e]¼ x 84 in.; [f]¼ x 36 in.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haideman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 straights.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid $28-$28.50; barge, Brownsville, Tex., $30-$31.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00†
Brazilian iron ore, 68.5%	21.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$19.00-19.50
Domestic, concentrates, f.o.b. milling points	22.00-23.00

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian, 88-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$34.00-35.00†
48% no ratio	25.00-26.00†

South African Transvaal

44% no ratio	18.00†
48% no ratio	24.00-26.00†

Turkish

48% 3:1	36.00-37.00†

Domestic

Rail nearest seller

18% 3:1	30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.50-2.75
60-65%	2.80-3.20

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, $\frac{7}{32}$" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill (Per Base Box; Products 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, (per keg) 400 keg min.	$8.15

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.50
100 mesh, pails	9.85‡
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.75
Unannealed (99+% Fe)	33.25
Unannealed (99+% Fe) (minus 325 mesh)	58.25
Powder Flake (minus 16 plus 100 mesh)	29.25
Carbonyl Iron:	
98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	35.10-52.20†
Bronze, 5000-lb lots	53.10-52.70†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic:	
Minus 35 mesh	$1.00
Nickel	$1.15
Nickel-Silver, 5000-lb lots	60.70-69.00†
Phosphor-Copper, 5000-lb lots	66.00
Copper (atomized) 5000-lb lots	46.50-64.50
Solder	7.00*
Silicon	70.00*
Stainless Steel, 304	89.00*
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	21.20-34.40‡
Tungsten:	Dollars
Carbon reduced, 98.8% min., minus 65 mesh	nom.**
Chromium electrolytic 99.8% Cr, min., metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens	
Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50
Oven Foundry Coke	
Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.95	$6.00	$5.85	$5.70	$6.10
Bar Size Angles	5.95	6.00	5.85	5.75	6.10
Structural Angles	5.86	5.91	5.76	5.66	6.01
I-Beams	5.86	5.91	5.76	5.66	6.01
Channels	5.86	5.91	5.76	5.66	6.01
Plates (basic bessemer)	5.98	6.03	5.88	5.78	6.13
Sheets, H.R.	7.50	7.55	7.40	7.30	7.65
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.70	9.75	9.60	9.50	9.85
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.80	9.85	9.70	9.60	9.95
Sheets, C.R. (drawing quality)	10.70	10.75	10.60	10.50	10.85
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.08	24.20	24.42	24.15	25.47
Barbed Wire (†)	6.50	6.55	6.40	6.30	6.65
Merchant Bars	6.39	6.44	6.29	6.19	6.54
Hot-Rolled Bands	7.90	7.95	7.80	7.70	8.05
Wire Rods, Thomas Commercial No. 5	6.60	....	6.45	6.45	6.70
Wire Rods, O. H.	7.05	....	6.90	6.90	7.15
Bright Common Wire Nails (§)	7.95	8.00	7.85	7.75	8.10

†Per 82 lb net reel. §Per 100-lb keg, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg.	5.00
Toluene, one deg. (deld. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant.

Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, 10 lb pigs, per gross ton. Palmerton, Pa. 21-23% Mn, $102.50, 19-21% Mn, 1-3% Si, $100; 16-19% Mn, $98. For Neville Island, Pa., prices add $2.50 as of Feb. 1. Lump 35 lb and down: Deduct $2 from 10 lb pig prices at Palmerton.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net tons, $220, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $228 per net ton, f.o.b. Anaconda, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 4c for max 0.15% C grade from above prices, 5.3c for max 0.03% C, 6.6c for max 0.5% C, and 8.1c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 24c per lb of contained Mn; packed, carload 25.3c, ton lot 26.9c, less ton 28.1c.

Electrolytic Manganese Metal: Min carload, bulk, 34.25c; 2000 lb to min carload 37c; less ton, 39c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump bulk, 1.50% C grade, 18.5-21% Si, 11.6c per lb of aloy. Packed, c.l. 12.8c, ton 13.25c, less ton 14.25c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.3c from above prices. For 3% grade, Si 12.5-16% deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35 less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome: No. 1 (Cr 61-65%, C 5-7%, Si 5-8%), 22.00c.

Blocking Chrome: No. 1 (Cr 61-65%, C 5-7%, Si 5-8%), 22.00c; No. 2 (Cr 58-63%, C 5-6%, Si 8-10%), 23.00c; No. 3 (Cr 58-63%, C 5-6%, Si 10-12%), 23.00c.

Refined Charge Chrome: No. 1 (Cr 50-55%, C 5% max, Si 2% max), 25.00c; No. 2 (Cr 56-60% C 5% max, Si 2% max), 25.00c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 35.75c per lb contained Cr; 0.010% max, 36.75c. Delivered.
Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max 37.75c; 1.5% max. 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.3c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). SM x D, carload, bulk, 20.05c per lb of alloy carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max, 26.25c per lb contained Cr and 14.60c per lb contained Si; Cr 33-36%, Si 45-48%, C 0.05% max, 28.25c per lb contained Cr. 14.60c per lb contained Si; 0.75 in. x down, 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (C 99.8% min, metallic basis Fe 0.2% max). Contract, cariot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.
Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al 40%, Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk, 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload, $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 13.7c per lb of briquet; c.l., packed, bags 14.9c; 3000 lb to c.l., pallets 14.9c; 2000 lb to c.l., bags 16.1c; less ton 17c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 14c per lb of briquet; c.l. packed, bags 15.2c; 3000 lb to c.l., pallets 15.2c; 2000 lb to c.l., bags 16.4c; less ton 17.3c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ⅛ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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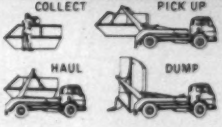

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Scrap Price Decline Is Extended

STEEL's composite on No. 1 heavy melting grade drops another $1.17 a ton to $35. Bottom not yet in sight, with consumer buying limited and supplies increasing

Scrap Prices, Page 148

• **Chicago**—Most scrap prices have eased off another $1 a ton, and a few grades $2. Trading is light. An important mill, which a week ago touched off a market drop by purchasing No. 2 bundles for $20, a drop of $3 a ton, last week announced $35 as its buying price for No. 1 heavy melting steel in March. That's a reduction of $1 a ton. This consumer has cut its February buying price from $43 to $41 but by midmonth was accepting only small tonnages from selected suppliers. Bulk of this grade of scrap moves direct from the company generating it to the mill, and usually it is generated from steel made by the mill.

• **Philadelphia**—Prices have slipped further, with domestic buying small and foreign business lagging. Expectations are the market will strengthen once foreign commitments are set up for the second quarter. Japan is now negotiating for requirements for that period, and some European consumers are showing more interest. At the moment, however, there's a disposition among foreign buyers to await developments in the domestic market before making new commitments.

Most grades have undergone a drop of $1 to $2 a ton. No. 1 heavy melting is now holding at $36 delivered, No. 2 heavy melting $32, No. 1 bundles $40, No. 2 bundles $22, No. 1 busheling $40, and electric furnace bundles $42. Mixed borings and turnings are nominally lower at $21, and shoveling turnings are nominally lower at $24-$25. Machine shop turnings are off nominally to $29-$30. On light sales couplers, springs, and wheels are lower at $48, and rail crops are $65-$66. Heavy breakable cast is down $1 to $44 and drop broken machinery is quoted at $52.

• **New York** — Brokers' buying prices on the major steel grades have dropped sharply. Reasons: Lack of domestic demand and absence of important foreign buying. Japan is negotiating for second quarter requirements.

No. 1 heavy melting steel and No. 1 bundles are off $4 a ton to $31-$32. Brokers have dropped their prices on No. 2 heavy melting steel $8 a ton, to $21-$22. No. 2 bundles are off $3 to $16-$17. Mixed borings and turnings are down $3 to $9-$10; low phos structurals and plates are off $1 to $38-$39.

• **Boston** — Brokers' buying prices on the steel grades are off $3 to $4 a ton from the peak reached earlier this year. The cast iron grades are steady on spasmodic buying. The steel items are increasingly dependent on exports and eastern Pennsylvania demand. Most brokers are covered on export tonnage, and domestic buying is light.

• **Detroit**—The auto lists went at $6 to $8 a ton under prices bid a month ago, although the tonnages were about the same. There are

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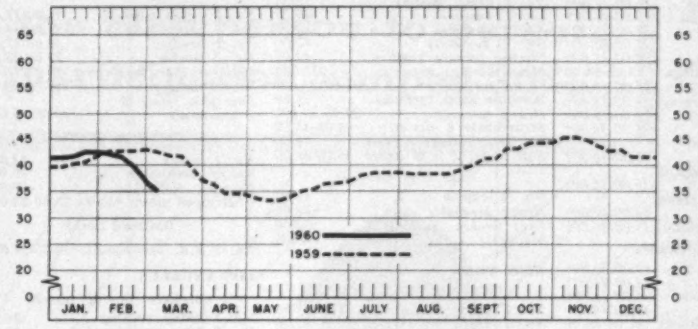
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL.



Mar. 2 1960	Week Ago	Month Ago	Year Ago	Feb. Avg.
$35.00	$36.17	$42.00	$42.33	$38.87

some exceptions. The Chrysler list was about 2000 tons higher on No. 1 items. There's doubt that the companies will be able to make list commitments this month because of production cutbacks.

There's a small local order out for No. 2 bundles at $15.30. Also, there's an on-track order for industrial bundles at $32, but so far there have been no takers. The outlook is that prices will slide some more the rest of this month, and that there won't be any pickup for 60 to 90 days.

• **Pittsburgh**—Prices are tumbling here in spite of a 98 per cent steelmaking rate. There have been several sales of No. 1 heavy melting scrap at $36. One of the district's biggest consumers bought No. 1 dealer bundles at $37, No. 2 heavy melting at $29, and No. 2 bundles at $25—with remote shippers getting $2 more for each of the grades. Brokers for a mill on the fringe of the district paid dealers $36 for No. 1 heavy melting, delivered, and $31 for No. 2 heavy melting. GM's Fisher Body Div. sold factory bundles to brokers at $41 to $43, about $8 less than they brought a month ago. Observers believe that secondary grades are close to bottom and that continued cold weather will retard collections.

• **Cleveland**—In the absence of representative buying, quoted prices are nominal. They're largely based on brokers' appraisals. Except for a small sale of cut foundry steel, the market was lifeless here last week. As a result, prices continue to sink, with dealer supplies rising and large tonnages of industrial material being offered. No. 1 heavy melting is now quoted $34-$35 here and $37-$38 in Youngstown. Those prices are off $2 from a week ago. Other grades are down correspondingly, including foundry and electric furnace material.

• **Buffalo**—Prices are off $2 to $3 a ton, but quotations are nominal in the absence of mill purchases. These are expected momentarily. Dealers have lowered their buying prices on most grades, and it's expected next mill purchases will be at prices $3 under those recently prevailing. Plenty of scrap is available.

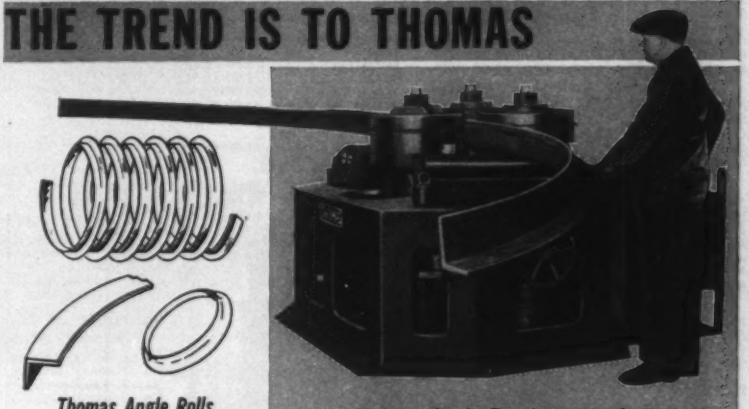
• **Cincinnati**—Principal steelmaking grades are off $1 to $4 a ton, with No. 1 heavy melting quoted $31.50-$32.50. Tumbling of prices in the dealer market was caused by the sharp decline in bids on industrial lists, plus the lack of buying by a local mill.

• **St. Louis**—Scrap prices are off another 50 cents to $4 a ton. Buying is sporadic and of small quantities. Further downward price adjustments are expected before the bottom has been hit. The mills have plenty of stocks.

• **Birmingham**—The long expected reduction in scrap prices came last week in this area when brokers

(*Please turn to Page* 153)

FOR SEGMENT OR CIRCLE BENDING OF ANGLES
THE TREND IS TO THOMAS



Thomas Angle Rolls will handle angles up to 6 x 6 x 7/8"

Thomas Angle Benders are of all steel construction and come in two styles and four sizes. Standard rolls permit "leg in" and "leg out" bending of angles. The machines may be converted for bending flats, rounds, squares, beams, channels, pipe and other shapes.

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Write for Bulletin 314-A

65

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Mar. 2, 1960. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Mar. 2	$35.00
Feb. 24	36.17
Feb. Avg.	38.87
Mar. 1959	40.40
Mar. 1955	37.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 dealer bundles	*36.00-37.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*35.00-36.00*
No. 1 factory bundles	44.00-45.00
Machine shop turnings	21.00-22.00
Mixed borings, turnings	21.00-22.00
Short turnings	*27.00-28.00*
Cast iron borings	*27.00-28.00*
Cut structurals:	
2 ft and under	*44.00-45.00*
3 ft and under	*43.00-44.00*
Heavy turnings	*34.00-35.00*
Punchings & plate scrap	*48.00-49.00*
Electric furnace bundles	45.00-46.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	46.00-47.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	47.00-48.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Random rails	55.00-56.00
Angles, splice bars	50.00-51.00
Railroad specialties	*51.00-52.00*
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	120.00-125.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*33.00-35.00*
No. 1 hvy melt., dealer	32.00-33.00
No. 2 hvy melting	*28.00-29.00*
No. 1 factory bundles	37.00-38.00
No. 1 dealer bundles	*32.00-33.00*
No. 2 bundles	19.00-20.00
No. 1 busheling, indus.	*33.00-35.00*
No. 1 busheling dealer	32.00-33.00
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*18.00-19.00*
Shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Cut structurals, 3 ft	*40.00-41.00*
Punchings & plate scrap	*42.00-43.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Stove plate	*44.00-45.00*
Unstripped motor blocks	*40.00-41.00*
Clean auto cast	*54.00-55.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
R.R. malleable	57.00-58.00
Rails, 2 ft and under	*53.00-54.00*
Rails, 18 in. and under	*54.00-55.00*
Angles, splice bars	*48.00-49.00*
Axles	54.00-55.00
Rails, rerolling	*57.00-58.00*

Stainless Steel Scrap

18-8 bundles, solids	*210.00-215.00*
18-8 turnings	*110.00-115.00*
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*17.00-18.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*15.00-16.00*
No. 1 busheling	*28.00-29.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*9.00-10.00*
Shovel turnings	*8.00-9.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Stove plate	*34.00-35.00*
Heavy breakable	*34.00-35.00*
Unstripped motor blocks	*26.00-27.00*
Charging box cast	*34.00-35.00*
Clean auto cast	*47.00-48.00*

CLEVELAND

No. 1 heavy melting	*34.00-35.00†*
No. 2 heavy melting	*26.00-27.00†*
No. 1 factory bundles	*40.00-41.00†*
No. 1 bundles	*34.00-35.00†*
No. 2 bundles	*21.00-22.00†*
No. 1 busheling	*34.00-35.00†*
Machine shop turnings	13.00-14.00
Shovel turnings	*17.00-18.00†*
Mixed borings, turnings	*17.00-18.00†*
Cast iron borings	*17.00-18.00†*
Cut foundry steel	*35.00-36.00†*
Cut structurals, plate 2 ft and under	*45.00-46.00†*
Low. phos. punchings & plate	*35.00-36.00†*
Alloy free, short shovel turnings	*18.00-19.00†*
Electric furnace bundles	*35.00-36.00†*

Cast Iron Grades

No. 1 cupola	*49.00-50.00†*
Charging box cast	*33.00-34.00†*
Heavy breakable cast	*35.00-36.00†*
Stove plate	*44.00-45.00†*
Unstripped motor blocks	37.00-38.00
Brake shoes	*35.00-36.00†*
Clean auto cast	*52.00-53.00†*
Burnt cast	*42.00-43.00†*
Drop broken machinery	54.00-55.00

Railroad Scrap

R.R. malleable	58.00-59.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	*58.00-59.00†*
Rails, random lengths	53.00-54.00
Cast steel	*44.00-45.00†*
No. 1 railroad cast	54.00-55.00
Railroad specialties	*47.00-48.00†*
Angles, splice bars	*47.00-48.00†*
Rails, rerolling	*62.00-63.00†*

Stainless Steel (Brokers' buying prices: f.o.b. shipping point)

18-8 bundles, solids	*205.00-210.00†*
18-8 turnings	*105.00-110.00†*
430 clips, bundles, solids	*110.00-115.00†*
430 turnings	*35.00-45.00†*

YOUNGSTOWN

No. 1 heavy melting	*37.00-38.00†*
No. 2 heavy melting	*27.00-28.00†*
No. 1 busheling	*37.00-38.00†*
No. 1 bundles	*37.00-38.00†*
No. 2 bundles	*24.00-25.00†*
Machine shop turnings	16.00-17.00
Shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	*39.00-40.00†*
Electric furnace bundles	*39.00-40.00†*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00†*

BUFFALO

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*31.00-32.00*
Shovel turnings	*21.00-22.00*
Machine shop turnings	*17.00-18.00*
Cast iron borings	*19.00-20.00*
Low phos. structurals and plate, 2 ft and under	*41.00-42.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	49.00-50.00

Railroad Scrap

Rails, random lengths	*44.00-45.00*
Rails, 3 ft and under	*50.00-51.00*
Railroad specialties	*41.00-42.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.50-32.50*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*31.50-32.50*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*31.50-32.50*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*15.00-16.00*
Shovel turnings	*19.00-20.00*
Cast iron borings	*18.00-19.00*
Low phos. 18 in.	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Heavy breakable cast	*37.00-38.00*
Charging box cast	*39.00-40.00*
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
Rails, 18 in. and under	*59.00-60.00*
Rails, random lengths	*50.00-51.00*

PHILADELPHIA

No. 1 heavy melting	*36.00*
No. 2 heavy melting	*32.00*
No. 1 bundles	*40.00*
No. 2 bundles	*22.00*
No. 1 busheling	*40.00*
Electric furnace bundles	*42.00*
Mixed borings, turnings	*21.00†*
Shovel turnings	*24.00-25.00†*
Machine shop turnings	21.00
Heavy turnings	*29.00-30.00†*
Structurals & plates	43.00-45.00
Couplers, springs, wheels	*48.00*
Rail crops, 2 ft & under	*65.00-66.00*

Cast Iron Grades

No. 1 cupola	42.00
Heavy breakable cast	*44.00*
Drop broken machinery	*52.00*
Malleable	*64.00†*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*16.00-17.00*
Machine shop turnings	8.00-9.00†
Mixed borings, turnings	*9.00-10.00*
Shovel turnings	13.00-14.00†
Low phos. structurals & plates	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	37.00-38.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	*36.00-37.00*

Stainless Steel

18-8 sheets, clips, solids	200.00-205.00
18-8 borings, turnings	90.00-95.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*30.00-31.00*
No. 1 busheling	*30.00-31.00*
Machine shop turnings	*9.00-10.00*
Shovel turnings	*14.00-15.00*
No. 1 cast	39.00-40.00
Mixed cupola cast	*34.00-35.00*
No. 1 machinery cast	40.00-42.00

BIRMINGHAM

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*38.00-39.00*
Cast iron borings	*12.00-13.00*
Machine shop turnings	*21.00-22.00*
Shovel turnings	*22.00-23.00*
Bar crops and plate	*41.00-42.00*
Structurals & plate	*41.00-42.00*
Electric furnace bundles	*38.00-39.00*
Electric furnace:	
3 ft and under	*37.00-38.00*
2 ft and under	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*49.00-50.00*
Charging box cast	29.00-30.00
Unstripped motor blocks	*38.00-39.00*
No. 1 wheels	*41.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
Rails, 18 in. and under	*53.00-54.00*
Rails, rerolling	*55.00-56.00*
Rails, random lengths	*47.00-48.00*
Angles, splice bars	*45.00-46.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	35.00
No. 2 heavy melting	33.00
No. 1 bundles	*38.00*
No. 2 bundles	24.00
No. 1 busheling	*38.00*
Machine shop turnings	*16.50*
Shovel turnings	*18.50*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	*41.00†*
Heavy breakable cast	*41.00†*
Unstripped motor blocks	*42.00†*
Clean auto cast	50.00
Stove plate	*43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00*
Rails, 18 in. and under	50.00
Rails, random lengths	*45.00*
Rails, rerolling	*58.00†*
Angles, splice bars	*45.00†*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*21.00-22.00*
Machine shop turnings	*15.00-16.00*
Shovel turnings	*19.00-20.00*
Low phos. plate & structurals	*42.00-43.00†*

Cast Iron Grades

No. 1 cupola	*42.00†*
Heavy breakable	29.00†
Foundry malleable	*39.00†*
Unstripped motor blocks	35.50-36.50†

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00†*

LOS ANGELES

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	35.00
No. 1 bundles	34.00
No. 2 bundles	21.00
Machine shop turnings	19.00
Shovel turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades

No. 1 cupola	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

PORTLAND, OREG.

No. 1 heavy melting	37.00
No. 2 heavy melting	34.00
No. 1 bundles	34.00
No. 2 bundles	*27.00*
Shovel turnings	22.00
Electric furnace bundles	44.00-45.00

Cast Iron Grades

No. 1 cupola	*36.00*
Heavy breakable	35.00
Unstripped motor blocks	*30.00*
Stove plate	*24.00*

SEATTLE

(Prepared, f.o.b. car)

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	*27.00*
No. 2 bundles	20.00-22.00
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	45.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable cast	30.00
Unstripped motor blocks	25.00
Stove plate (f.o.b. plant)	21.00†

SAN FRANCISCO

No. 1 heavy melting	38.00
No. 2 heavy melting	34.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Shovel turnings	16.00
Cut structurals, 3 ft	44.00

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

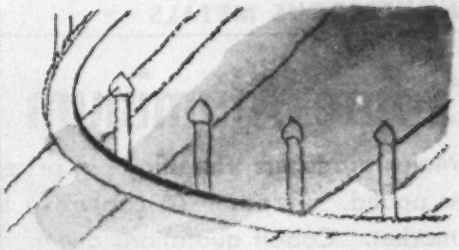
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	24.00
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	13.00
Prepared	32.25
Unprepared	26.25
Shovel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

"When we talked about the Plan person-to-person, participation jumped 30%!"

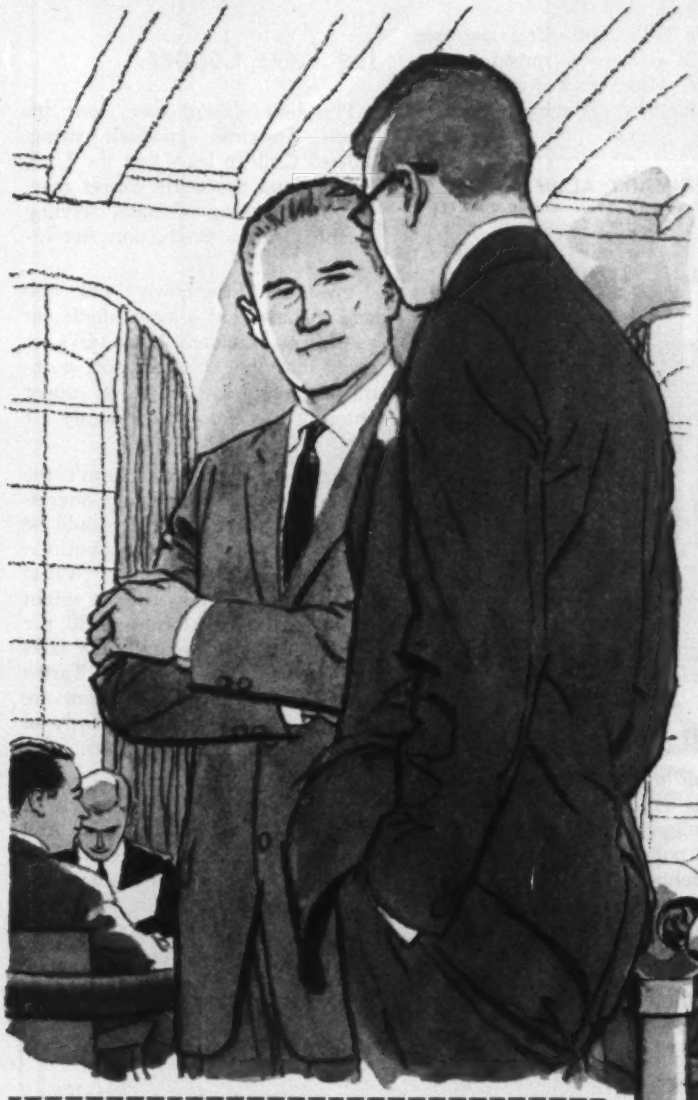


In our company we've made the Payroll Savings Plan available for some time. I thought, naturally, that we had a large participation. But when I checked up a few weeks ago I discovered that only about 22% of our people were making use of the Plan. It's so easy to say, "Sure, this is a fine idea, and I'll sign up next payday."

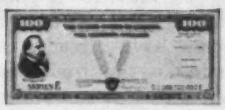
What our people needed was someone to explain this convenient savings plan *in person;* someone to show them that just signing the card would put this fine thrift program into automatic operation. They needed somebody to invite them to *start right now.*

When I contacted our State Savings Bonds Director, he helped us set up a thorough, informative canvass of everybody on our staff. As a result more than 30% additional employees signed up for this easy, systematic way to buy U.S. Savings Bonds, *regularly.*

Perhaps *your* organization, too, has a large percentage of employees who have *never been invited* to combine patriotism with basic thrift through the Payroll Savings Plan. Companies with high employee participation are enthusiastic about its benefits in terms of lower employee turnover, better safety records, and the satisfaction engendered by helping large numbers to contribute to our Nation's Peace Power. The greater your employee participation, the more substantial your company benefits will be. Contact your State Savings Bonds Director for prompt, practical help in spreading Payroll Savings information, *person-to-person.*



NOW! U. S. SAVINGS BONDS EARN 3¼%



STEEL
The Metalworking Weekly

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

Some Aluminum Prices Cut

Major producers trim alloy pig prices by as much as 4 cents a pound. Purpose: To capture a larger share of castings market. Cobalt quotations down. Ike talks copper

Nonferrous Metal Prices, Pages 152 & 153

PRIMARY aluminum producers are out to capture a bigger share of the aluminum casting market. And if you're a foundryman, diecaster, alloyer, or user of aluminum castings, you'll probably benefit.

• **Prices Down**—Here's the story: Last week, Aluminum Co. of America initiated a reduction in the major grades of alloy pig containing silicon. Alcoa's move was followed within hours by other primary producers.

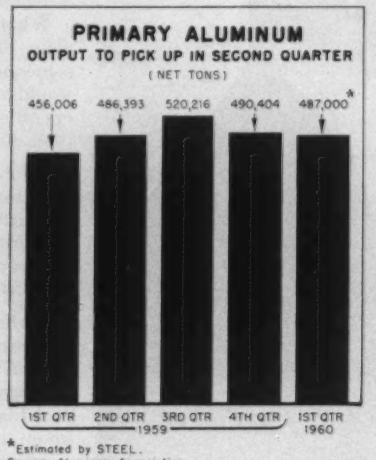
• **Wooing Autos**—You'll hear two reasons given for the move: Technological improvements in alloying, and reduced prices in silicon. But the big reason is the desire to get a bigger share of the casting market —particularly diecastings where uses have been spiraling in such major areas as autos and appliances.

The secondary aluminum industry has traditionally controlled the lion's share of this market, averaging 60 to 65 per cent of total sales each year. With such major uses as aluminum engine blocks imminent, the primary people want to swing the percentage in their favor.

• **Secondary Motivations**—It's speculation, but two other factors might well have contributed to the price reduction decision: 1. To combat any gains the magnesium industry might have made in auto circles with its program to supply metal to carbuilders at a concession. 2. To possibly take some of the steam out of the government's investigation of hot metal contracts by offering metal to the alloyers and smaller fabricators at savings.

Look for the smelters to take action to meet the increased competition. Some have already cut prices to maintain the traditional spread—others are expected to lower prices momentarily.

• **When All's Said**—You may see the price reductions spread to the other pig alloys that don't contain high amounts of silicon, and as seems to be logical, to the alloy ingots.



*Estimated by STEEL.
Source: Aluminum Association.

Cobalt Prices Drop

Cobalt prices have been reduced 25 cents a pound across the board. STEEL now quotes a range of $1.50-$1.57 a pound, depending on quantity. Behind the cut is increased world production and the feeling by producers that new uses will be engendered by lower prices. January and February sales were rated "fair" by producers—and are at about the same level as in 1959. It's unlikely you'll see any further price drops for quite a while. Producers point out the price level has come down from $2.60 to the present quotation in just a few years.

Ike Talks Copper

President Eisenhower, on his South American goodwill swing, quieted Chilean fears that the U. S. would upset the world copper market by disposing of metal residing in the Defense Production Act inventory.

President Eisenhower was also said to have lent a sympathetic ear to Chilean President Alessandri's request that the U. S. support a reduction in the import tax on copper entering this country (presently 1.7 cents a pound).

President Eisenhower hasn't the power to remove the tax. Congress could suspend it, but this would be highly unlikely due to opposition of mine state legislators. What could happen is that the tax might be reduced a maximum of 20 per cent at the forthcoming June talks on General Agreement on Tariffs and Trade. U. S. negotiators are authorized to act independently of Congress within those limits.

The consuming industry would favor a tariff reduction because it would mean cheaper copper. And a reduction wouldn't hurt the feelings of U. S. producers that have foreign holdings. Sure to oppose such a move, however, would be strictly domestic producers.

NONFERROUS PRICE RECORD

	Mar. 2 Price	Last Change	Previous Price	Feb. Avg	Jan. Avg	Mar., 1959 Avg
Aluminum	26.00	Dec. 17, 1959	24.70	26.000	26.000	24.700
Copper	33.00-35.00	Dec. 23, 1959	33.00	34.000	34.000	32.031
Lead	11.80	Dec. 21, 1959	12.30	11.800	11.800	11.238
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	101.125	Mar. 2, 1960	101.00	101.170	99.875	103.000
Zinc	13.00	Jan. 8, 1960	12.50	13.000	12.917	11.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

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er quality at all essential

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LFUJI TOKYO

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 25.60; No. 43, 25.90; No. 195, 30.70; No. 214, 31.50; No. 356, 26.30, 30 lb ingots; 10 lb ingots, add 0.4 cent per lb; 6 lb ingots, add 0.6 cent per lb.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.00-26.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.50 per lb deld.

Cobalt: 99+%, $1.50 per lb for 500-lb keg, $1.52 per lb for 100 lb case; $1.57 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 33.00 deld.; custom smelters, 35.00; lake, 33.00 deld.; fire refined, 32.75 deld.

Germanium: First reduction, ingots, less than 1 kg, 36.00-37.50 per gram; 1-10 kg, 30.50-32.00 per gram; 10 kg or more, 28.10-29.99 per gram; intrinsic grade, under 10 kg, 31.95 per gram; 10 kg or more, 29.95 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex., 1.3 in. diam. x 12 in. sticks, 57.00 f.o.b. Madison, Ill.

Magnesium Alloy: AZ91A (diecasting), 40.75; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $213-215 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, in kegs, 74.50; "F" nickel, 5 lb ingots, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-90 per troy oz nom.

Palladium: $24-26 per troy oz.

Platinum: $82-85 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $137-140 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $3.00 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 101.125; prompt, 100.75.

Titanium: Sponge, 99.3+% grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $3.50-4.25.

Zinc: Prime western, 13.00; brass special, 13.25; intermediate, 13.00, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 14.25; special high grade, 14.50 deld. Diecasting alloy ingot No. 3, 16.50; No. 2, 17.00; No. 5, 16.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7 per lb; over 500 lb $6.50 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 27.25-29.00; No. 12 foundry alloy (No. 2 grade), 25.00-25.25; 5% silicon alloy, 0.60 Cu max., 25.50-25.75; 13 alloy, 0.60 Cu max., 25.50-26.00; 195 alloy, 28.00-28.75; 108 alloy, 25.50-25.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.50; grade 2, 24.25; grade 3, 23.25; grade 4, 22.75.

Brass Ingot: Red brass, No. 115, 30.75; tin bronze, No. 225, 41.50; No. 245, 36.00; high-leaded tin bronze, No. 305, 35.25; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 29.25.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.25; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.975, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.955, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 38.35; l.c.l., 38.98. Weatherproof, 20,000-lb lots, 38.55; l.c.l., 39.30.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $6.75-15.50; sheared mill plate, $5.25-9.00; wire, $5.55-9.50; forging billets, $3.20-4.75; hot-rolled and forged bars, $4.00-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 28.00; ribbon zinc in coils, 22.50; plates, 21.50.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

(Selected products and sizes)

Flat Sheets: 1100, 3003, and 5005, mill finish, 30,000 lb base, f.o.b. customer custody.

Thickness Range (in.)	Widths (in.)	Length Range (in.)	Price Range
0.250-0.136	24-72	72-180	45.10-47.70
0.136-0.096	24-72	72-180	45.50-48.70
0.096-0.077	24-72	72-180	46.20-50.00
0.077-0.068	24-72	72-180	46.70-51.70
0.068-0.061	24-72	72-180	46.70-55.00
0.061-0.048	24-72	72-180	47.30-57.30
0.048-0.038	24-72	72-180	47.80-60.20
0.038-0.030	24-72	72-180	48.20-65.30
0.030-0.024	24-60	72-180	48.70-56.60
0.024-0.019	24-60	72-180	49.40-59.90
0.019-0.017	24-48	72-144	50.30-57.00
0.017-0.015	24-48	72-144	51.20-58.00
0.015-0.014	24-36	72-144	52.30
0.014-0.012	24-36	72-144	53.50
0.012-0.011	24-36	72-144	54.60
0.011-0.0095	24-36	72-144	56.20
0.0095-0.0085	24-36	72-96	57.50
0.0085-0.0075	24-36	72-96	59.20
0.0075-0.007	24-36	72-96	60.80
0.007-0.006	24-36	72-96	62.50

ALUMINUM (continued)

Plates and Circles: Thickness, 0.25-3 in.; width or diam., 24-60 in.; lengths, 72-240 in., mill finish.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	44.60	49.40
5050-F	45.70	50.50
3004-F	46.70	52.40
5052-F	47.30	53.10
6061-T6	47.80	53.90
2024-T4	51.80	58.90
7075-T6*	60.50	67.90

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base, 12 ft lengths.

Diam.	Round		Hexagonal	
(in.)*	2011-T3	2017-T4	2011-T3	2017-T4
0.125	72.90	75.80	....	....
0.188	....	....	....	78.20
0.250	58.00	61.60	70.70	72.30
0.375	57.20	62.40	69.00	70.50
	2011-T3	2017-T451	2011-T3	2017-T451
0.500	57.20	62.40	69.00	70.50
0.625	57.20	62.40	65.80	66.60
0.750	55.70	60.70	59.60	62.60
0.875	55.70	60.70	59.60	62.60
1.000	55.70	60.70	59.60	62.60
1.125	53.30	58.30	57.50	60.40
1.250	53.30	58.30	57.50	60.40
1.375	53.30	58.30	57.50	60.40
1.500	53.30	58.30	57.50	60.40
1.625	51.00	55.60	....	58.20
1.750	51.00	55.60	56.30	58.20
1.875	51.00	55.60	....	58.20
2.000	51.00	55.60	56.30	58.20
2.250	49.50	54.00	....	58.20
2.500	49.50	54.00	....	58.20
2.750	47.90	52.20	....	58.20
3.000	47.90	52.20	....	58.20
3.250	....	52.20	....	....
3.375	....	52.20	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 47.20-56.90; 6061, 43.20-56.90; 7075, 61.50-71.20; 7079, 66.50-76.20.

Pipe: ASA schedule 40, alloy 6063-T6, 3-40 ft. lengths, plain ends, 90,000 lb base, dollars per ft. Nominal pipe sizes: 1 in., 31.55; 1¼ in., 42.75; 1½ in., 51.05; 2 in. 61.70; 3 in., 123.40; 4 in., 169.55; 5 in., 229.60; 6 in., 304.60; 8 in., 458.40; 10 in., 706.45 (3-24 ft. lengths).

Extruded Solid Shapes:

Factor	Alloy 6062-T5	Alloy 6062-T6
1-14	44.70-46.20	53.20-59.90
15-17	44.70-46.20	55.60-60.80
18-23	45.20-46.80	57.70-66.40
24-32	45.20-46.80	65.60-78.80
33-38	48.80-51.40	82.30-93.40
39-44	58.70-62.40	99.90-121.00

MAGNESIUM

Sheets and Plate: AZ31B standard grade, .032 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.90
24-26	66.10-68.40	90.60-91.30
36-38	71.50-75.30	104.20-106.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 25.00-25.50; No. 2 heavy copper and wire, 21.50-22.00; light copper, 20.00-20.50; No. 1 composition red brass, 18.00-18.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 33.00c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	57.13b	54.86c	....	58.32	29.000	29.000	28.250
Yellow Brass	50.57	36.06d	50.86	54.23	22.250	21.250	20.250
Low Brass, 80%	53.53	53.22	53.82	57.09	24.750	24.500	24.000
Red Brass, 85%	54.58	54.27	54.87	58.14	25.750	25.500	25.000
Com. Bronze, 90%	56.17	55.86	56.46	59.48	26.750	26.500	26.000
Manganese Bronze	58.86	52.21	62.69	....	20.875	20.625	19.875
Muntz Metal	53.20	48.28	....	....	20.875	20.625	20.125
Naval Brass	55.12	48.68	61.43	58.78	20.750	20.500	20.000
Silicon Bronze	62.86	61.80	62.15	80.79	28.375	28.125	27.375
Nickel Silver, 10%	65.98	68.06	68.06	....	26.875	26.625	14.937
Phos. Bronze	77.44	78.19	77.69	79.37	29.875	29.625	28.625

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.50-17.00; new brass clippings, 14.50-15.00; light brass, 11.00-11.25; heavy yellow brass, 12.00-12.50; new brass rod ends, 12.00-12.25; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.00-14.25; brass pipe, 14.00-14.25.

Lead: Soft scrap lead, 8.00-8.25; battery plates, 3.00-3.25; linotype and stereotype, 9.00-9.50; electrotype, 7.25-7.75; mixed babbitt, 9.50-10.00.

Monel: Clippings, 28.00-29.00; old sheets, 24.00-26.00; turnings, 20.00-22.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 56.00-58.00; rolled anodes, 54.00-56.00; turnings, 43.00-45.00; rod ends, 54.00-56.00.

Zinc: Old zinc, 4.50-5.00; new diecast scrap, 4.25-4.50; old diecast scrap, 2.75-3.00.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.00-14.50; mixed high copper clips, 12.00-12.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.50-13.00; clean borings and turnings, 9.00-9.50; segregated low copper clips, 16.50-17.00; segregated high copper clips, 15.50-16.00; mixed low copper clips, 15.50-16.00; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 12.00-12.25; clean borings and turnings, 11.00-11.50; segregated low copper clips, 16.00-16.50; segregated high copper clips, 15.00-15.50; mixed low copper clips, 15.50-16.00; mixed high copper clips, 14.50-15.00.

REFINERS' BUYING PRICES

(Cents per pound, cariots, delivery refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 59.00; light scrap, 54.00; turnings and borings, 39.00.

Copper and Brass: No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.75; light copper, 23.50; refinery brass (60% copper) dry copper content, 23.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.75; light copper, 23.50; No. 1 composition borings, 22.00; No. 1 composition solids, 22.50; heavy yellow brass solids, 16.00; yellow brass turnings, 15.00; radiators, 17.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.50.

Copper: Flat-rolled, 50.04; oval, 48.00; 5000-10,000 lb; electrodeposited, 42.50; 2000-5000 lb lots; cast, 45.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 119.50; 200-499 lb, 118.00; 500-999 lb, 117.50; 1000 lb or more, 117.00.

Zinc: Balls, 20.50; flat tops, 20.50; flats, 23.25; ovals, 22.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.40 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 16.00; 2000-5900 lb, 14.00; 6000-11,900 lb, 13.75; 12,000-22,900 lb, 13.50; 23,000 lb or more, 13.00.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,900 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 79.10; 100-600 lb, 69.70; 700-1900 lb, 67.00; 2000-9900 lb, 65.10; 10,000 lb or more, 63.80.

Stannous Chloride (Anhydrous): 25 lb, 154.40; 100 lb, 149.50; 400 lb, 147.10; 800-19,900 lb, 106.20; 20,000 lb or more, 100.10.

Stannous Sulphate: Less than 50 lb, 139.60; 50 lb, 109.60; 100-1900 lb, 107.60; 2000 lb or more, 105.60.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 147)

came out with new lists $2 to $4 a ton lower than recently quoted. The reductions bring prices in line with those quoted in other sections of the country. The market is at a standstill, but consumers are reported planning to buy March delivery tonnage when it appears prices have about hit bottom.

• **Houston**—Prices continue to slip. Mill demand is weak, and export buying is at a standstill. Sharply lower over-the-scale prices have been only partly effective in reducing yard intake. There is no likelihood of an improved demand this month, and no possibility of a reversal of the declining price trend.

• **Los Angeles**—District mills are not buying, and some of the foundries are out of the market. Tonnage movement has been braked in recent weeks by consumers' efforts to hold down inventories until after the local inventory tax date, Mar. 1. Japanese scrap needs for second quarter are being quoted on. In the absence of an active market, quoted prices are nominal.

• **San Francisco** — The market is weak, and a price markdown seems imminent. The steel production rate is wavering; one large mill is down to 54 per cent of rated capacity.

• **Seattle**—The market here and in Portland (Oreg.) is soft and inactive. Large consumers have sizable inventories and are buying only limited tonnage. Current prices are under pressure. There is only minor interest in export tonnage.

Steel Importers Seek To Unload Stocks at Houston

Buying of foreign steel on the futures market is at a near standstill in the Houston area. Importers, many with excessive stocks, are taking losses as they seek to unload tonnage. For example, a price list of one importer offers a wide range of new steel products at an average price of $5.50 per 100 lb. Broker stock list prices generally are below the price for futures.

Foreign mills seem to be holding the line against new reductions, in-

MANAGER OF MATERIALS

Research and Development

New position responsible for initiation and management of Research and Development projects in the areas of metallurgy, ceramics and organic materials. Will also act as consultant to design engineering and fabricating departments of this major national company with centralized Research and Development laboratories located in midwest.

Scope will include supervision of preparation of process specifications, solution of fabrication problems and service failure investigation.

Candidate should possess 5 years experience as a materials and process Engineer and/or experience in Materials Research and Development. Educational background should include advanced degrees or equivalent experience.

Send complete resume to Box 837, STEEL, Penton Bldg., Cleveland 13, Ohio. All replies treated in confidence.

NEED JUNIOR PARTNER

With senior management talent for established structural steel shop. $50,000 cash investment required. Opportunity to acquire senior interest. Location in expanding central California area.

Box 835, STEEL
Penton Bldg. Cleveland 13, Ohio

WANT TO BUY

Steel By-Products Discs

2"	to 2½"	Dia. .060 to .125
4½"		Dia. .060 to .125
6½"	to 10"	Dia. .060 to .125
11"	to 12½"	Dia. .085 to .095

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Purchasing Department
Tel. Slatington, Pa. PO 7-3821

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for your new surplus motors, controls and transformers!
AVAILABLE: NEW MOTORS
Over 3,000 new motors in stock from ¼HP to 200HP. Special low prices

Write, wire or phone collect!
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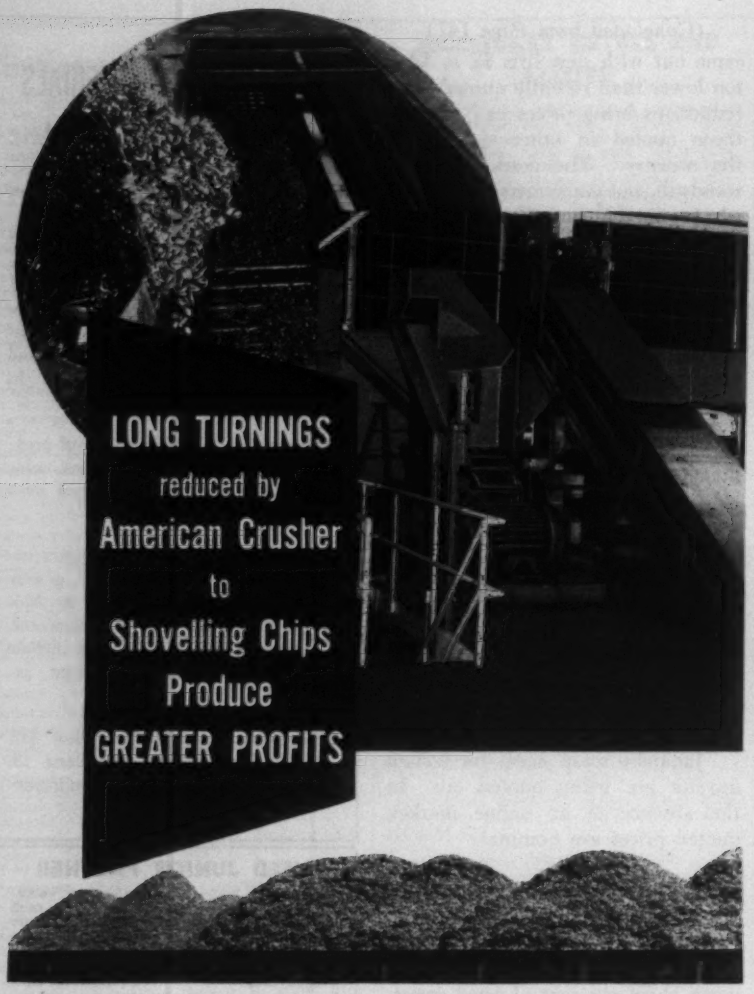
STRUCTURAL STEEL FABRICATING PLANT

For Sale or Lease

In Central California in midst of great industrial expansion. 250 Ton Monthly Capacity One Shift. $107,000 including real estate. Suitable 2 or 3 men.

Box 832, STEEL
Penton Bldg. Cleveland 13, Ohio



American Metal Turnings Crusher

. . . increases profits . . . improves handling

An almost fully automatic chip salvage system, with an American Metal Turnings Crusher at its heart has increased profits, saved space, and improved housekeeping at a ball bearing plant, conveyors service two rows of automatic screw machines and feed a cross-over conveyor. The cross-over conveyor feeds turnings directly into an American Metal Turnings Crusher which reduces the turnings to uniform sized chips. From the crusher chips are conveyed to a hopper to be periodically discharged into a chip-wringer to reclaim cutting oil. Dry chips drop into a discharge hopper and feed into an air duct which pneumatically conveys the chips to a storage bin at the rail siding.

Literature on American Metal Turnings Crushers is yours for the asking.

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1539 MACKLIND AVE. ST. LOUIS 10, MO.

dicating a heavily booked position into April. Unless sharp price cuts are made soon, the volume of foreign steel arriving in Gulf ports during April, May, and June will drop to a trickle.

Steel Imports Top 1959 Exports by Wide Margin

Imports of iron and steel products in 1959 totaled 5,515,909 net tons, valued at $661,014,980, reports the U. S. Department of Commerce. Comparisons: 1,702,819 tons in 1958; 1,152,549 in 1957; 1,334,338 in 1956; 970,022 in 1955; and 783,657 in 1954.

At the same time, exports fell sharply, totaling 2,102,970 net tons, valued at $511,295,718. That total compares with 2,687,415 tons in 1958; 5,175,448 in 1957; 4,156,747 in 1956; 3,870,889 in 1955; and 2,659,017 tons in 1954.

Leading imports were: Wire rods, 448,055 tons; reinforcing bars, 851,943 tons; carbon bars, 212,793 tons; plates, 291,360 tons; sheets and strip, 332,933 tons; structural shapes, 766,503 tons; pipe and tubing, 553,135 tons; wire, 236,566 tons; nails, 304,830 tons; pig iron, 699,200 tons.

Leading exports were: Structurals (not fabricated) 225,918 tons; oil country goods and line pipe, 101,972 tons; tin plate, 196,264 tons; cold rolled sheets, 211,798 tons; tin plate seconds, 187,034 tons.

British consumers are buying "a fair amount" of U. S. sheets, London reports. American mills are reported offering March and April delivery at competitive prices, whereas European mills are said to be heavily committed until June and July.

Britain is still taking in continental steel on contract at prices much lower than those quoted for stock lots on the open market.

Last year Great Britain imported 259,000 tons of sheet steel. It's estimated Britain will have to import 200,000 tons in 1960 despite rising home production.

• **Learn how you can earn $1000! See Servicenter, Pages 5 and 6.**

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Tempilstik°

*temperature indicating crayons**

Tempilstik°—a simple and accurate means of determining preheating and stress relieving temperatures in welding operations. Widely used in all heat treating—as well as in hundreds of other heat-dependent processes in industry. Available in 80 different temperature ratings from 113°F to 2500°F . . . $2.00 each.

Send for free sample Tempil° Pellets. State temperature desired . . . Sorry, no sample Tempilstiks°

Most industrial and welding supply houses carry Tempilstiks° . . . if yours does not, write for information to:

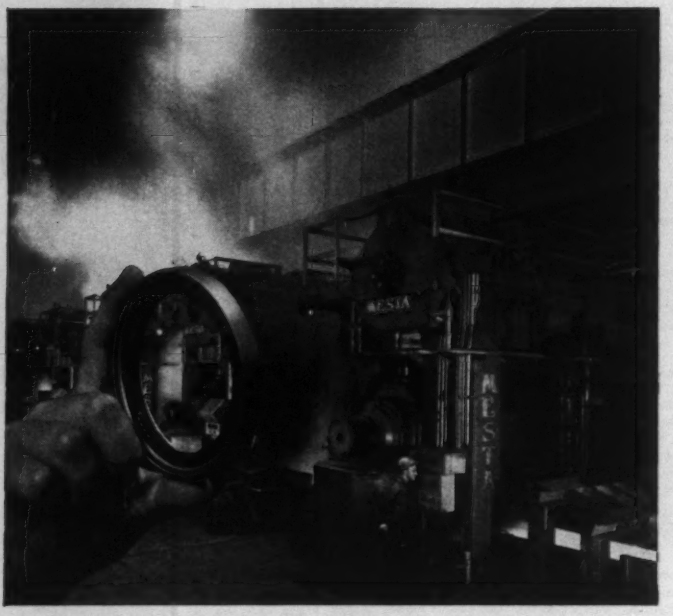
PROMOTION DEPARTMENT

Tempil° CORPORATION
132 West 22nd St., New York 11, N. Y.

*Also Tempil° Pellets and Tempilaq° (liquid form)

Visit our Booth 407, Great Western Exhibit Center, Los Angeles, Cal., April 26-28.

ENGINEERED OIL SEALS for Steel Mills

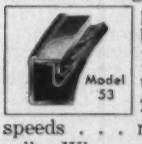


Garlock KLOZURE Oil Seals protect vital bearings from damage, add to efficiency of new Jones & Laughlin punch card-operated continuous mill at Aliquippa, Pa.

Jones & Laughlin Steel Corporation specifies Garlock KLOZURE* Oil Seals to protect important bearings on new punch card-operated mill at Aliquippa.

At dozens of vital locations on the 44" 4-Hi Continuous Mill—approach and runout tables, vertical edgers, coilers, rotary crop shears—the Garlock KLOZURE Oil Seals perform a double duty. They stop leakage of lubrication from the bearings, prevent harmful scale, spray, dirt from getting to the bearings.

In wide use today throughout the steel industry, Garlock KLOZURE Oil Seals are available in a wide range of designs. For example, Model 142, a face-type KLOZURE, is designed to seal surfaces perpendicular to shaft . . . keeps water splash and scale out of bearings at the shoulder of mill rolls. Models 64 and 82 are applied to large shafts at normal or high speeds . . . ideal for protecting bearings on back-up and work rolls. Model 53 withstands temperatures up to 250°F at normal or high speeds . . . recommended for table rolls. Where equipment can't be dismantled easily, Models 21 or 23 Split-KLOZURES are the choice.



Like Jones & Laughlin, many of the large steel producers are enjoying the advantages of Garlock KLOZURE Oil Seals. For instance, all KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40°F to +250°F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500°F.

Enjoy these same benefits. Talk to your local Garlock representative about high-quality KLOZURE Oil and Grease Seals. Call him at the nearest of

GARLOCK

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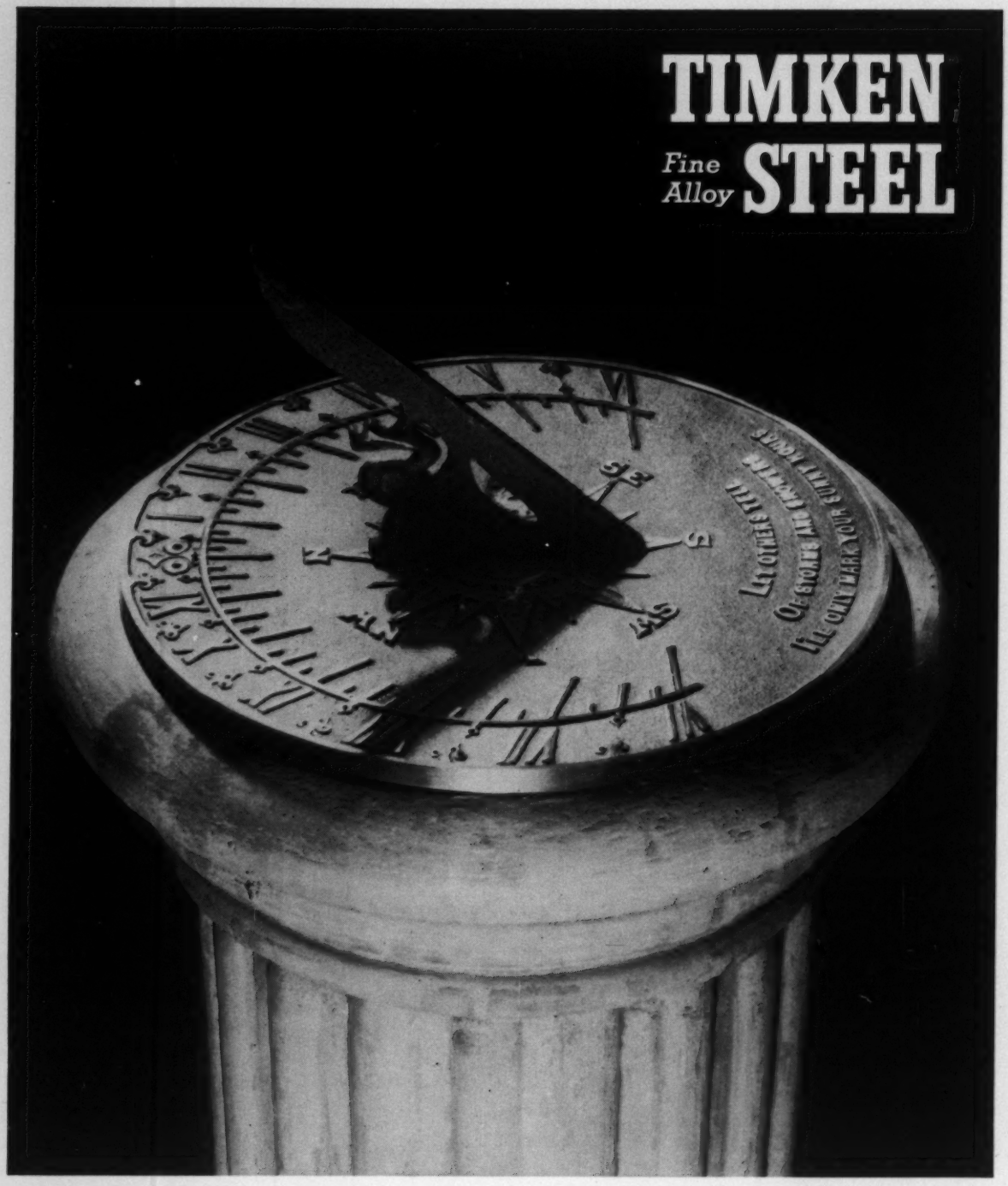

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